

NAVY MEDICINE

January-February 2002



NAVY MEDICINE sails with the *Truman*

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Cover: USS *Harry S. Truman* (CVN-75) tests its flight deck countermeasure washdown system while underway off the Virginia coast. *Navy Medicine's* recent visit to the *Truman* on page 3. Photo by PHC(AW/SW) Cathy Brenneman.

Korean War Vet Donates Artwork to NNMC

The May-June 2001 issue of Navy Medicine ran an article featuring the Korean War art of Marine Corps veteran John Fenwick, drawings he created while recovering from his wounds at NNMC Bethesda back in 1952. The following updates that story.



Photo by HMM3 Katherine Hopper, NSHS, Bethesda MD

(Left to right) John Fenwick, Howard Sirak, Richard Baiocchi.

The donation of art to the National Naval Medical Center on 10 July 2001 turned into more than just that. It turned into an emotional reunion. Korean vet John Fenwick came to donate some of the artwork he created as part of his treatment at Bethesda after being seriously wounded in Korea.

His buddy, Richard Baiocchi, who lost his jaw during the same battle, came for the event, as did Howard Sirak, the Navy physician who treated them both at a field hospital. All three brought their wives. Glen Snowden, the hospital corpsman who lost an arm trying to treat Fenwick during the same battle, lives in Texas and was unable to

attend. Four lives converged again after 50 years, three in person, and the fourth in the hearts and memories of the others.

It was a little tense at first, with polite acknowledgments of introductions and superficial queries as to each other's health, but that part didn't last beyond the first few minutes. Then they were able to look closely at each other, and the years fell away as they began to see the young men they once knew behind the faces of the older men before them now.

Former Marine John Fenwick turned to Dr. Howard Sirak, the man who saved his life, and said with simple understatement, "You did a good job." The doctor looked embarrassed.

Baiocchi joined them and Sirak asked him how he was. Baiocchi answered, "Fine, thanks to you."

In a few minutes, Richard Baiocchi and John Fenwick were chatting, smiling, and laughing together. In between sentences, they averted their eyes, only to return and sneak looks at each other. During everything, Fenwick's eyes kept straying to his drawings, which were displayed at the front of the auditorium.

Here in this auditorium were two Marines and a surgeon, thrown together by war, a war that was never referred to as a war. Korea was called a conflict. The two Marines think the doctor is a hero. The doctor thinks the two Marines are the heroes. The truth is, they all are.

Nearly 50 years before, bullets were flying all around as three young men ran and dodged through a valley of hell—hospital corpsman Glen Snowden and two Marines, Richard Baiocchi and John Fenwick. A fourth person would come into play later, but none of them knew that at the time.

Fenwick was hit first, his insides ripped to shreds. He lay on the cold ground as corpsman Glen Snowden rushed toward him. Stuffing whatever he could find into Fenwick's wounds to stop the bleeding, Snowden prepared to give him a shot of morphine. Fenwick was conscious the whole time and remembers every minute of it.

Snowden never got to administer that shot. That was because his arm was rendered useless by machine gun bullets before he could. "I was standing up at the wrong time—very stupid," he jokes now. But right there, on the battlefield, with his arm hanging limp by his side, Snowden motioned to another Marine to come and help, not knowing that the two Marines were buddies. However, Richard Baiocchi had seen his comrade fall and was already on his way.

"Give him this shot of morphine," corpsman Snowden told Baiocchi, and explained how to administer the shot through Fenwick's pants. And, just as he began to press the needle home, Baiocchi's jaw was blown off. Suddenly, three young Americans found themselves hideously wounded on a battlefield in Korea.

Navy Reserve doctor Howard Sirak, 30 years old, was called to active duty in 1950. He left a wife and baby girl behind, and was doing his time treating the wounded at the furthest advanced, definitive care facility there, Easy Med. The three wounded men would end up in his care.

They all remember him well, they say. He was the man who saved their lives. He is a hero to them. And he remembers all of them, too, remembers wondering how in the world they were going to make it and, if they did, how they were going to be able to live anything close to normal lives when they returned to the Norman Rockwell worlds from which they had come.

Fifty years have passed, taken up by healing, getting on with their lives, and trying to forget. Where were their buddies? Had any of them made it home? Were they dead or alive? What had happened to them?

They know now. They all made it back, and they all still remember that long-ago incident that inexorably changed their lives and tied them together forever.

The doctor, Howard Sirak, lives in Columbus, OH, and had a successful career as a heart surgeon. The hospital corpsman, Glen Snowden, lives in Houston, TX, and went to work as a postman delivering the mail with one arm. One of the Marines, Richard Baiocchi, had his jaw rebuilt, lives in Hershey, PA, and is retired from the job he returned to at the Hershey factory. The other Marine, John Fenwick, has lived an active life as a long-haul trucker, door-to-door salesman, and a commercial diver who worked on the Chesapeake Bay Bridge when it was going up.

Three of them met again at NNMC for the first time since it all happened—the two Marines and the doctor who saved their lives. The fourth, hospital corpsman Glen Snowden, wasn't well enough to come to the reunion, but spoke to them all by phone. It was closure of a sort, they all say. It was good, and they plan to keep in touch. □

—Story by Teal Ferguson, NNMC Public Affairs

Sailing with the USS *HARRY S. TRUMAN* (CVN-75)

I am sound asleep. Somewhere there's a rumbling boom. I open my eyes and stare at the ceiling. I find I'm holding my breath, but no other sound comes. As I become more awake, I realize I'm waiting for the whine of jet engines. Then it comes to me. I'm in my own bed and it must have been a large truck passing on the road in front of my house, and not the catapult launching a jet from the deck of an aircraft carrier. I drift off back to sleep remembering three rather sleepless nights spent onboard one of the Navy's largest aircraft carriers.

At the invitation of CDR Lee R. Mandel, MC, USNR, the *Truman's* senior medical officer, I had the opportunity to steam with the USS *Harry S. Truman* in July 2001. To say the *Truman* is one of the largest aircraft carriers in the fleet is to understate the issue. As we entered and then exited the Hampton Tunnel near Norfolk, I caught site of the carriers at their piers. They all looked large to me at that distance, but that was only a mild comprehension of large. As we approached the piers at the Norfolk Naval Station all the ships were large. Then we reached the last pier, Pier 12, where the *Truman* is docked. I walked to the guard gate where I was scheduled to meet CDR Mandel, and looked up. Well, yes, she is large.

CDR Mandel said we would "walk aboard." Ha! Walk aboard! We climbed moveable steel brows up and up. That may well have been a stairway to the stars. They went on forever. Eventually, we entered the *Truman* via the officer's brow to the quarterdeck. Fortunately, Dr. Mandel was carrying my seabag.

He and I went first for a short tour of the medical department then up to the officer's mess for something



Photo by CDR Lee Mandel, MC, USNR

The author in deck gear.

cold to drink. Then I got a tour and explanation of how to find your way around a carrier. When we began searching for my room, the word large took on a definition you could never imagine. The ship is broken down into frames. Each frame has a number and at each intersection there is a little map with a little arrow that says "you are here." You would think that any competent American woman would be able to figure it out. After all, it looks a lot like a map in a shopping mall. Nevertheless, I kept finding myself saying "here," not having a clue just where "here" was.

As one of the largest aircraft carriers afloat, the *Truman* measures 1,096 feet in length. Her flight deck covers 4 1/2 acres and is 251 feet wide at the widest point. Her anchors, hand-me-downs from the USS *Forrestal* (CV-59), weigh 30 tons each, and are attached to the ship with more than 1,000 feet of chain containing 684 links. Each anchor chain link weighs 365 pounds. This floating airport-fortress stands 20 stories high from the waterline to the mast and displaces 97,000 tons of water. After construction on the *Truman* began in April 1993, 7-years elapsed before she set sail on her maiden deployment in November 2000.

With the air wing aboard, the *Truman*'s crew numbers 5,200. In order to accommodate these personnel, 2,700 compartments are required. The galleys serve over 18,000 meals a day. It is quite an operation.

The nuclear-powered vessel contains two reactors powering four screws, each weighing 66,200 pounds. The *Truman* can exceed 30 knots when necessary. I can testify to this. During flight operations, the flight deck needed more wind for launching aircraft. The skipper increased our speed, and very shortly we had wind!

Four steam catapults are available on the flight deck to launch aircraft, each capable of slamming a fully fueled and loaded aircraft from standstill to 150 knots in 2 seconds! There are also four elevators to transport aircraft between the flight deck and hangar bay. The airwing of more than 80 tactical aircraft—Carrier Air Wing Three (CAW 3)—is comprised of nine squadrons that call the *Truman* home.

It is not enough merely to provide this crew a place to sleep and eat. The key to maintaining operations is to keep everyone healthy and on the job. With no subway stops in the middle of an ocean, getting to a doctor or a dentist could be problematic. And that's why the medical department and dental department aboard the *Truman* resemble a small town community hospital or medical center.

The senior medical officer runs the medical department, and is always an aerospace medicine residency trained flight surgeon. The staff includes a general surgeon, a general medical officer, three airwing flight surgeons, a physician's assistant, a nurse anesthetist, a critical care trained nurse, a clinical psychologist, and a physical therapist. Other key personnel include a medical administrative officer, who wears two other hats—division officer and radiation health officer, a lead chief petty officer, two independent duty hospital corpsmen, and a compliment of 40 additional corpsmen.

The medical department has one operating room, with another backup OR for mass casualties or the treatment of patients potentially contaminated in the unlikely event of a reactor "spill." There is an inpatient ward with 51 beds, two isolation rooms with four beds each, and a three-bed intensive care unit (ICU). The medical department also features full laboratory facilities, a digital x-ray department with telemedicine capability, and a "walking" blood bank. Should the need arise, there are over 300 Sailors already blood-typed who are ready to donate blood when the blood bank is activated. The air wing flight surgeons, along with the senior medical officer, provide full aeromedical capabilities including flight physicals and all preventive medicine services including immunization. The *Truman* even has comprehensive optometry services. The staff can perform optical refractions and make glasses for you onboard. During the *Truman*'s maiden deployment, the medical department saw 10,502 patients.

Something new on carriers is the presence of a clinical psychologist and physical therapist. They are part of a 5-year study to see if

Telemedicine

Since the advent of digital radiography onboard the HST, there have been numerous advantages to this technology. Because of a much lower volume of x-rays required, the use of x-ray developer has decreased significantly. So has the need for discarding exhausted developer. With a new automatic x-ray processing system, the frequency of dealing with constant cross contamination of chemicals has been virtually eliminated. So has the need for storage of film and patients' radiographic studies. Also, there is minimal error in radiographic technique. If a radiographic image is too dark or light, one simply adjusts the contrast through the computer, eliminating the need to repeat an image because of suboptimal technique. This is a great advantage in a shipboard environment, where personnel are sometimes cross-trained to perform basic diagnostic imaging. This system consists of three viewing monitors strategically located in the medical department and a processing unit that electronically labels the individual patient's information within the system.

One of these three viewing stations is used solely for sending or transmitting radiographic studies to a shore based facility for interpretation by a radiologist. The radiologist interprets the study and sends the results back via email. This system affords the physicians/providers additional information for immediate treatment of patients. Additionally, the shipboard x-ray technologist does not have to carry or mail hundreds of radiographic studies to shore facilities for a radiologist's interpretation.

The telemedicine portion of this unit also has another feature that is an added help. In the event someone has a dermatological problem, one can take a digital picture of a patient's skin problem, input the information into the RADWORKS system and transmit it to a shore medical treatment facility for evaluation by a dermatologist. Once received by a dermatologist, the images will be reviewed, and the results phoned or emailed to the onboard physician with a diagnosis as well as a course of treatment for specific or related conditions.

Essentially, this system helps save time and makes available new resources that are not used with a conventional radiographic processing system at sea or even a foreign military medical treatment facility.

deploying these services with a battle group will benefit "healthcare to the deckplates" and determine the benefits, both for health and cost purposes, of onboard treatment of Sailors and aviators.

The first permanently assigned physical therapist and physical therapy technician on the *Truman* reported April 2000 and August 1999, respectively. CDR Erin Patterson, MSC, is the first permanently assigned physical therapist. She evaluates nearly all musculoskeletal and orthopedic injuries, and is assisted by a physical therapy technician. Physical therapy services are available both during day and evening hours to accommodate shift workers. This allows the primary care providers to concentrate on additional sick call issues. CDR Patterson also conducts preventive health classes such as low back injury prevention and knee school, usually on a weekly basis. There are excellent gym facilities which allow for extended physical therapy and can advance patients more appropriately through their rehabilitation and return them to full duty. Questionable cases can be discussed with orthopedic surgeons through the use of email and x-rays transmitted by digital camera images.

Clinical psychologist, CDR Joseph Biron, MSC, and HM2(SW/AW) Raymond Jackson, the mental health technician, were the first mental health team assigned to the *Truman*. As such, they had to create the division from the deckplates up. The Behavioral Health Services Division now functions as both the ship's and the *Truman*'s Battle Group's sole mental health resource. Patients from the battle group's ships were transported to, and evaluated onboard. CDR Biron also made a series of psychological "housecalls" via helicopter. The Behavioral Health Services Division established a Critical Incident Response Team (CIRT) aboard the *Truman*.

The dental department's head is currently CDR Kevin F. Flynn, DC, USN. In addition to his dental degree, CDR Flynn has a

medical degree. He is also an oral/ maxillofacial surgeon. There are four general dentists and one dental hygienist. There are also 14 dental assistants (dental technicians) which include administrative personnel, laboratory technicians, and expanded function technicians. They perform dental cleanings as well as chairside assists. The dental department can accommodate full spectrum dentistry including fillings, root canals, prosthetics (crowns, bridges, dentures), and cleanings. There are six dental treatment rooms, one minor surgery operating room, dental x-ray room, sterilization room, and dental laboratory.

The dental laboratory is able to fabricate all crowns, bridges, etc. The surgical capabilities include dental extractions, minor procedures such as excision of lesions and biopsies, and care of trauma patients (suturing lacerations, broken teeth, broken jaws, etc.). For more complex procedures such as surgical repair of complex facial fractures, they utilize the the medical department's operating room. Procedures are performed using local anesthetic or conscious sedation. They also have full dental radiograph (x-ray) capabilities and a central sterilization area. The *Truman* receives patients from other ships in the battle group that do not have dental departments. While deployed they care for a crew and embarked air wing totaling more than 8,000. Onboard, the staff sees every crewmember at least once a year for a routine preventive dentistry exam and a dental cleaning. During a re-



USS *Harry S. Truman* at Pier 12.

Photo by author

The Rainbow Connection

During my very short "deployment" on the *Truman* carrier qualification operations were underway. Up on the flight deck, I was struck by the veritable rainbow of colorful outfits associated with the flight deck crew. For every job on the flight deck and in the hanger bay the crewmember wears a distinctive color.

Purple shirts take care of aviation fuel and are referred to as "grapes."

Blue shirts are the plane handlers, aircraft elevator operators, tractor drivers, messengers, and phone talkers.

Green shirts are the catapult and arresting gear crews, air wing maintenance personnel, cargo-handling personnel, ground support equipment (GSE) troubleshooters, hook runners, photographer's mates, and helicopter landing signal enlisted personnel (LSE).

Yellow shirts are the aircraft handling officers, catapult and arresting gear officers, and plane directors.

Red shirts are ordnancemen, crash and salvage crews, and explosive ordnance disposal (EOD).

Brown shirts are air wing plane captains and air wing line leading petty officers.

White shirts are air wing quality control personnel, squadron plane inspectors, landing signal officers (LSO), air transfer officers (ATO), liquid oxygen (LOX) crews, safety observers, and medical personnel.

cent 6-month deployment they saw over 6,000 patients, performing over 30,000 procedures. These procedures included more than 1,400 fillings placed, over 750 wisdom teeth extracted, and more than 1,000 cleanings.

As someone who has worked 12 years with the Navy Medical Department, first at the National Naval Medical Center, Bethesda, and then at BUMED, it is sometimes difficult for me to comprehend all we really do. One often hears about "Healthcare to the Deckplates," but that concept takes on a new meaning when one confronts the volume of medical and dental activity onboard the *Truman*. Medical and dental personnel not only tend to the everyday events that occur at sea such as eye irritations and infections, sprains, falls, cuts, colds and flu, but they also maintain the crew's health by vigorously practicing preventive medicine and dentistry virtually 24 hours a day, 7 days a week. It is most impressive, and makes one feel good to see that the men and women who are out there protecting us are being well cared for.

Finally, it was Saturday morning and I had to wrap things up and get ready to take the afternoon COD (Carrier Onboard Delivery) flight back to Norfolk Naval Air Station. I was sad to leave, and at the same time very ready to depart, with 3 sleepless nights worth of luggage under my eyes, and bruises on the backs of my legs from going up and down ladders, home looked awfully good. It really made me think about what homecoming really means to Sailors as they arrive at their homeport after a long deployment.

Since my adventure, I continually pinch myself to make sure it really happened. Then I look at all my snapshots. I hope I have the opportunity to do it again sometime. There's so much more to see and so many more questions to ask. □

—Story by Janice Marie Hores, Assistant Editor, *Navy Medicine*, (MED-09H), Bureau of Medicine and Surgery, Washington, DC.

Carrier Air Wing THREE conducts a flyover of USS *Harry S. Truman* (CVN-75) in the Persian Gulf. The carrier spent 4 months of her maiden deployment enforcing the "no fly zone" over southern Iraq in support of Operation Southern Watch.



Photo by PHC(AW/SW) Cathy Breneman

An MIA Comes Home

It was not the homecoming the Manning family had hoped for. There were no parades, no bands, no “welcome home” hugs, and kisses and no smiles. On 22 July 2000, Ronald James Manning came home and was laid to rest, with full military honors, at Toronto Union Cemetery in Toronto, OH. It had been 25 years, 2 months, and 7 days since the Air Force CH-53 that he was flying in was shot down and crashed into the sea just off of the coast of Koh Tang Island, Cambodia. The helo was part of an assault mission to rescue the 40 crewmen of the SS *Mayaguez*, a U.S. merchant ship, which had been seized in international waters by communist Khmer Rouge forces on 12 May 1975, 60 miles off the Cambodian coast.

Manning was a hospital corpsman assigned to the 2nd Battalion, 9th Marine Regiment, 3rd Marine Division. A battalion landing team of 1,100 Marines had been flown in from bases in the Philippines and Okinawa to assemble at Utapao, Thailand, in preparation for the assault.

In the early morning hours of 15 May 1975, the first wave of 179 Marines headed for the island aboard eight Air Force “Jolly Green Giant” helicopters. Three helicopters unloaded Marines from the 1st Battalion, 4th Marine on the deck of the USS *Holt*. The other five headed for Koh Tang Island.



During the assault, Manning was onboard a Sikorsky CH-53 helicopter, call sign “Knife 31,” piloted by Air Force MAJ Howard Corson and 2nd LT Richard VandeGreer. This was the first helo that was to land on the east side of the island. It never made it. As the helo approached the island about 200 yards from shore, it was caught in a crossfire and hit by an enemy rocket which hit a fuel tank on the left side of the helo and exploded. The helicopter burst into flames. As the Marines inside Manning’s helicopter attempted to return fire from the cabin gun port and cockpit, a second rocket blew away the helicopter’s instrument panel. The severely damaged helicopter began falling from the sky. Marines fought to douse the flames that were consuming the aircraft, but the effort was futile.

Corson would not give up so easily. With his helicopter ablaze, he crash-landed it into the sea about 35 yards from the beach. Moments later, a second explosion consumed the rest of the aircraft.

To avoid enemy fire, survivors were forced to swim out to sea for rescue. Twelve onboard, including MAJ

Corson, were in the water for over 4 hours before being rescued. Others onboard were not as fortunate. Ten men, including Manning and fellow corpsman HM1 Bernard Gause, Jr., died in the explosion and crash. Three more attempted to advance on the beach but were killed almost instantly by a mass of gunfire. Over the 20 years, the fate of Manning, Gause, and 11 others would lay in the charred wreckage of "Knife 31," submerged in the waters off of Koh Tang Island.

In October and November of 1995, U.S. and Cambodian specialists conducted an underwater recovery of the helicopter crash site where they located numerous remains, personal effects, and debris from the aircraft associated with the loss. A total of 161 bones were painstakingly recovered.

The U.S. Army Central Identification Laboratory in Hawaii analyzed the remains and evidence. Using a technique called mitochondrial DNA analysis, the military is able to obtain a member's genetic makeup from bone fragments. Mitochondria, the cell's energy producers, contain DNA only from the mother's side of the family. Most DNA patterns decay rapidly after death, but mitochondria DNA located deep inside the bone tissue, lasts much longer. Scientists are able to compare this DNA with some taken from the maternal relatives of the MIA to look for a match. Through this process, the task force was able to identify some of the missing servicemen.

The Manning family was notified of these findings in December 1995 and Ron's mother, Donna Manning of Toronto, OH, was asked to give blood samples for possible DNA matching. Almost 4 ½ years later, on 26 March 2000, 24 years and 10 months after receiving that first fateful telegram, James and Donna Manning received a phone call. The military had positively identified their son's remains. HN Ronald James Manning, USN, was finally coming home.

According to James "Bo" Manning, Ron's brother, in early April 2000, an assistant program manager from the Armed Forces Identification Lab, along with four other active duty Navy personnel, paid the Manning family a visit at their Toronto home. Ron's five sisters and three brothers returned there for the visit. "The five visiting Sailors provided complete proof that Ron's remains had been positively identified," James said. "They discussed the incident with us, they discussed the remains and the identification process. They clearly explained the DNA process in detail." The military also provided the Mannings with a large book explaining how Ron's remains had been recovered and identified. "We had a lot of questions, and

to our relief, they were all answered beyond our satisfaction and in great detail."

The interment of Ron's remains has provided a great deal of closure to the Manning family. Realistically, they knew they had lost him 25 years ago. Emotionally, however, they were never really 100 percent sure. There was always that possibility that he could have escaped as others had and gotten ashore where no one had seen him. His sister, Lori, added, "I did not get the chance to know Ronnie that well. I was only 10 years old at the time of his death, but what memories I do have I will cherish them forever."

Identified along with Manning's remains were those of fellow hospital corpsman HM1 Bernard Gause, Jr., Marines LCPL Gregory S. Copenhaver, LCPL Andres Garcia, PFC Walter Boyd, PFC Lynn Blessing, PFC Antonio Sandoval, PFC Kelton R. Turner, and Air Force 2nd LT Richard VanderGreer.

Ronald James Manning enlisted in the Navy in December 1972. After graduating from boot camp, he attended Hospital Corps School at the Naval Training Center in Great Lakes, IL. For 18 months he was assigned to Naval Hospital, Portsmouth, VA. After attending Field Medical Service School at Camp Pendleton, CA, he was assigned to the 2nd Battalion, 9th Marine Regiment, 3rd Marine Division, Okinawa, Japan. While there he took part in the evacuation of Saigon during the last 2 weeks of April 1975, and ultimately, the rescue attempt of the crew from the *Mayaguez*. His military decorations include the Purple Heart, Combat Action Ribbon, Navy Unit Commendation Ribbon, Prisoner of War Medal, National Defense Medal, Vietnam Service Medal with bronze star, and the Republic of Vietnam Campaign Medal. He was a member of the Hospital Corps, the only enlisted corps in the military. Not only that, but he was a Fleet Marine Force (FMF) corpsman. It takes something above and beyond to be one, and even more so to do the job Ron was picked for. The Marines do not just take any "run of the mill" corpsman with them on missions like that. Now, 9,190 days after "Knife 31" crashed into the sea, HN Ronald James Manning has come home, honored as the true American hero that he is. □

—Story by HMCS(AW/NAC) David C. Constantine, Naval Air Station, Pensacola, FL.

NSA Station Hospital, Da Nang

A Personal History

James Chaffee

In May 1999, I was in the colonial style bar of the Furama Hotel, on the beach right next to the site of the old China Beach USO. A loud and boorish former Army nurse anesthetist, claiming to have served with an Army hospital in the Central Highlands, was yammering in my face. I had told him about NSA Station Hospital, which had been located a few miles south of this place, near the foot of the Marble Mountains and that in our triage we had no nurses; in fact, there were almost no nurse anesthetists at the hospital. He essentially called me a liar, told me the Navy was run by nurse anesthetists, then berated the whole unit, saying we could have provided better service had we staffed with nurses. Cutting him short, I insulted him, the Army, nurses in general, and he left the bar.

I had the privilege and good fortune of serving as a hospital corpsman at the Naval Support Activity Station Hospital, NSAH for short, near Da Nang from October, 1967 until June, 1969. Situated on the sandy strip on the east side of the Han River from Da Nang, between the Han River and the South China Sea, the hospital sat near the Marble Mountains just to the south. These five outcroppings dominated our landscape.

Part of a cluster of bases just north of the Marble Mountains, where the Da Nang perimeter ended, the hospital was across the Main Supply Road from MAG-16, a Marine Corps helicopter base on the beach. The hospital was on the west side of the road, the river behind it. On the south perimeter was a Seabee camp, and south of that, at the foot of the northernmost inland Marble Mountain, Nui Tho Son, was a dump. Across the road from the dump, on the beach at the foot of the big Marble Moun-



Photos courtesy of the author

The author.

tain, Nui Thuy Son, now generally referred to as The Marble Mountain in tourist guides, was the 5th Special Forces HQ. North of that was a POW compound, and then came MAG-16. Farther north the road to the China Beach USO exited the main road. On the hospital's north perimeter was a pagoda attached to the hamlet on the east perimeter, between the hospital and the river.

The original hospital was destroyed just before its completion in an attack in October, 1965, when MAG-16 was overrun. When I arrived, the rebuilt facility was a

major field hospital with air conditioned wards and operating rooms, and a large staff of specialists in areas ranging from tropical medicine and thoracic surgery to neurosurgery.

I was temporarily assigned to Receiving II, part sick bay and part outpatient clinic. Receiving I was next door, just off the chopper pad. This was the triage, where I would spend the bulk of my tour. But first I was permanently assigned to the same sort of medical ward as my previous assignment at Naval Hospital Yokosuka, Japan.

The Vietnam war would explode with the 1968 Tet Offensive, coinciding with my 21st birthday, just around the corner from my arrival. The year would be the most devastating of the war in terms of American casualties.

Hospital corpsmen at the Yokosuka Hospital received orders to Vietnam in groups. The previous groups had been sent to the Fleet Marine Force (FMF). A substantial number would not return alive. Our future seemed ominous as we received fresh combat casualties at the Yokosuka facility. The seriously wounded were evacuated as soon as possible and Yokosuka was one of the stops. We saw some of those we had served with returned, or read their names in the *Stars and Stripes*.

Surprise was the general response to the orders for NSA Station Hospital. Some of us were unhappy, having looked forward to serving with the "grunts," but most were puzzled, with no idea of the facility's location or its mission. I didn't understand that mission until recently.

What I did learn came after years of reflection on haunting personal experiences. The sense of mission at the hospital was intense, and our performance as corpsmen went beyond what anyone could expect from our 12 weeks of formal training. Those without the stamina to handle the daily stress sometimes made irrational decisions to get out.

When I got to NSAH the wards were staffed with a handful of nurses who went about their typical supervisory roles in starched white uniforms. I am not certain when they arrived, but I believe it was about the time I did, as there were corpsmen working the wards who had preceded the nurses. My recollection is that they were all at least lieutenant in rank. Most were lieutenant commanders, and they were led by a CDR Cannon who later made captain. Their role was largely symbolic, and there was an uneasy truce between the nurses and the doctors, with the corpsmen often caught between. The areas of the hospital where corpsmen had most freedom in treat-

ing patients—Receiving I and II—were not staffed by nurses, and in fact they almost never made an appearance in either place. There was one nurse in the OR, however, who may have been an anesthetist. She was always in scrub greens when we saw her, usually in the pre-op area just above the triage across from X-ray. But I am getting ahead of myself.

Staffing for the large, open bay wards was short. A single night corpsman often had to handle a ward with 60 or more patients. I remember making the temperature rounds at 0200 with a ward full of malaria patients, giving them the standard drill when their fevers were excessive: Sit under a cold shower and drink a recycled IV bottle full of cold water after swallowing five aspirin. Sometimes short on bedside manner, the wards provided a real bed, hot chow, showers and flushing toilets, and excellent medical care. To the grunt Marines, the majority of our patients, they were paradise. Transferring from the wards was nearly impossible; it took an insubordinate encounter with a nurse to get me out.

Weekly sick call for Vietnamese civilians at the orphanage near China Beach, a few miles north of us, provided rare civilian exposure. The whole area was off limits, particularly the city of Da Nang. The doctor who organized these Medical Civic Action Program (MEDCAP) visits, a firm believer in winning hearts and minds, was senior physician on my ward. A lieutenant commander, he was also a devout Catholic, and I assume he had made contact with the Vietnamese Catholic nuns who ran the orphanage through the Church. Their convent was next door to the orphanage.

The doctor had full trust in the ability of his corpsmen to treat what they could and refer what they could not, so we had total freedom on these visits, broadening our range of experience in disease and exposing us to the appalling local conditions. All this temporarily ended when the Tet Offensive made the MEDCAP visits too dangerous.

The medical ward was intensely busy, overflowing with malaria patients, most with *P. falciparum*, which can lead to cerebral malaria and death. There had been deaths from cerebral malaria. The lab was over-extended and samples sometimes sat unexamined for days. A lab tech showed me how to stain a slide with a drop of blood and examine it for parasites. The doctor had a microscope in his office and let me use it, encouraging me to take blood when a patient began the cycle of chills and fever. The nurse did not think I should be doing this duty, since it was



Receiving I.

the responsibility of the lab. This led to a shouting match one day, when I was examining a slide instead of mopping the floor.

In essence, I was fired. I was pretty certain that a captain's mast would be next, but I believe the doctor interceded, and I was transferred to Receiving I. That was a blessing.

The whole area of Receiving I intimidated. Large signs in the open covered outdoor triage beside the main walkway shouted in red OFF LIMITS and USE OF CAMERAS PROHIBITED. This was the first overflow triage. The main Receiving I quonset hut was beside it.

OFF LIMITS greeted you in red at the door to the main Receiving I quonset. Inside, the place was all business. On either side of the hut near the rounded ceiling, pipes extended the length of the room suspending bottles of Ringers lactate, ready for use. Pairs of saw horses lined both sides below the pipes, pulled out to support stretchers bearing casualties as they arrived. Jelkos and other equipment filled bins along the walls, and there was a cardiac board that doubled as a pinochle table. Along the front wall, near the door, hung Unit Ones, flak jackets, and helmets. The wall was lined with suction machines for chest tubes. The floor was concrete, stained brownish red, a drain in the center. The room was incredibly cold, and a sickly green light from bare overhead fluorescent tubes bathed the grayish interior.

A complement of corpsmen and stretcher bearers was assigned to Receiving I. The bearers, mainly Seabees or

seamen from the fleet, kept the triage clean, moved the patients from the chopper to triage to X-ray and pre-op, and sometimes performed medical procedures we taught them in case we were overloaded.

Receiving I corpsmen were at the top of the pecking order, a special bunch. But you had to prove yourself, and they doubted new personnel, especially those who had served on a medical ward. It was mostly learning

by doing, and the corpsmen who had served on surgery wards had a shorter learning curve.

Only one MD oversaw Receiving I, a junior surgeon on 24-hour duty, who called the duty senior physician if surgery was required. There were no nurses, no anesthesiologists, and the doctor was not on premises until needed. When casualties arrived, the corpsmen assessed the situation and began IVs using 14-gauge Jelkos, usually one in each arm and one in the neck. Corpsmen did venous cut-downs, inserted chest tubes, inserted tracheal tubes, and performed other emergency surgery. They were also on call to handle emergency ambulance runs and occasional chopper runs.

There were three triage areas. The main one was the quonset hut. The first open unit outside was set up much as the quonset hut—saw horses below pipes suspending bottles of Ringer's lactate ready for use. As with the quonset, vials of emergency fluids, mainly for those in cardiac arrest, were also at hand, but I believe the sterile pack with chest knife was only kept inside.

Across the walkway, the third area was full of saw horses and pipes, but IVs were not kept ready. This was for overflow mass casualties, and when it was needed personnel from other areas, like the laundry or pharmacy, would be brought in to set up IVs and help haul stretchers. During the Tet Offensive the three areas were full most of the time, and stretchers were lined upon the walkway waiting for X-ray or to get into the pre-op, which was also full.

The drill with wounded was pretty well worked out. Corpsmen and stretcher bearers ran to meet the chopper, with the bearers carrying empty stretchers in case the wounded were just stacked up on the floor of the chopper, which often happened, particularly with the CH-46, or if the wounded were on tanks or amtracs. Sometimes a CH-46 would be so loaded with wounded you wondered why those on the bottom didn't suffocate.

The wounded were brought in and their stretchers placed on the saw horses. Clothes and boots were cut off, blood pressure and pulse taken and written on bare chests in black marker. Three IVs with Ringer's were started and blood taken for cross matching at the blood bank, though sometimes this was difficult when the pressure was so low blood wouldn't flow. I remember seeing corpsmen do femoral sticks to find blood and start an IV, only later to have to restart it when pressure would build up enough to force the blood back into the bottle, having hit the artery and not the vein. Sometimes what flowed from wounds was Ringer's lactate. Seeing chests with 0/0 and 0 in black marker was not uncommon.

Circling above the room in my mind's eye, I can see the concrete floor covered with clotting blood like great mounds of liver, naked young men littering the room on blood-stained green stretchers while desperate corpsmen shout at them: "Make a fist!" starting an IV in the forearm, or "Bear down like you have to take a shit" trying to force up the vein in the neck.

During mortar and rocket attacks we stayed with the wounded and hoped for the best. There were enough hits on the chopper pad just outside the triage that the Seabees finally put up a pair of blockades of stacked railroad ties in front of the main quonset hut and the outdoor triage to stop shrapnel. Fortunately, none of the triages ever took a direct hit, though wards and an OR did.

After I left, I buried my personal experience, studying mathematics, then working in industry. It was a number of years before I really learned about where I had been and its mission. After three decades ignoring my past, I decided I needed to go back. I searched the web and wrote organizations, but didn't get any information. It seemed the place had been forgotten. Then one day I got a hit; I found the abstract of a paper written by some Navy physicians about a study done at the hospital and wrote for a copy of the paper.

Between January and June 1968, a study followed wounded patients from initial resuscitation through final

disposition. Part of this study took place during my own triage service. The study was shelved for decades. Published in March, 1988, in *Military Medicine*, the paper is entitled "Naval Support Activity Hospital, Danang, Combat Casualty Study." The authors were CAPT B.G. McCaughey, MC, USN, J. Garrick, MD, L.C. Carey, MD, and J.B. Kelley, BA. It had remained in the archives at the Naval Medical Research Institute for 20 years, though Dr. Garrick did analyze the data initially and described the results in a lecture in 1969.

The paper backs up my memory of the personnel staffing the triage-surgical theater. There were three anesthesiologists, and only two nurse anesthetists, and as I told the former Army nurse, those two nurses did not work the triage. In fact, on the rare occasion when there was a particularly difficult intubation to be performed (as on one occasion when a child blew open his mouth chewing a blasting cap), an anesthesiologist handled it, but usually the corpsmen did.

The statistics from the study make for interesting comparison. According to *The Vietnam War Almanac*, by Harry G. Summers, a former Army infantry colonel, the mortality rate for wounded Army personnel was nearly .036, while for Marines it was about .028. The NSAH study indicates that the mortality rate at the hospital was about .021, a significant improvement. Even if one includes the number considered DOA at NSAH, the figures are about .027. Of course, many factors affect these figures, only one of which is emergency unit effectiveness, but the fact that the Marine Corps bore the brunt of the fighting in the I Corps, where the enemy was better equipped and trained than in other sectors, seems to indicate that Navy corpsmen and physicians who served as medical personnel for the Marine Corps offered better service for their wounded.

A few comments in the study make these numbers even more impressive. "The types of casualties sent to NSAH were not representative of all those occurring in Vietnam, because the NSAH was staffed by a larger variety of specialists and thus more capable of handling difficult medical problems." When I talk to Marines who served in the area from Chu Lai to Hue, including all the hill country around Da Nang, and such hot spots as An Hoa, many of them remark on the NSA Hospital, particularly those who were wounded. I recall a retired gunnery sergeant who had spent time with the MPs who provided security for the hospital saying it was the best emergency

hospital in the world at the time. He was probably right. Staffed with experienced and senior medical personnel, the hospital mission was to handle the most difficult cases.

As with most of the hospitals in Vietnam, the bulk of the casualties came directly out of the field without first passing through aid stations. The helicopter made this possible, and it saved an incredible number of lives by shortening the time between being wounded and receiving care. This was also noted in the study: "Combat casualties were generally taken to NSAH via helicopter and without primary definitive care." This can explain how the number of Marine Corps KIA in Vietnam was so much smaller than for the Marines in World War II, even though the number of wounded was comparable. In World War II, transit time was generally 6 to 12 hours, while in Vietnam it was more like 2 to 4 hours.

The study does mention that the mean transit time was about 5 hours, suggesting that there were large outliers affecting this average. The authors wonder whether it might be the result of transfer of casualties from other units, but my experience is closer to that of Dr. Garrick, who recalls the difficulty of getting choppers into hot areas, particularly at night. The Marine Corps was using CH-46s, much larger and slower than the Army's Hueys, which were more effective at getting into tight spots. I recall getting huge loads of casualties on '46s who had clearly been lying in the field for some time, covered with mud and leaches, and often dragged out of inaccessible areas on ponchos and sometimes carried on stretchers fashioned from bamboo poles and ponchos. These men were outside the norm of the transit time of 2 to 4 hours because of the vicissitudes of combat.

This article showed me clearly what I had known intuitively all those years: NSA Hospital was a special field hospital, staffed with specialists and stocked with all the medical supplies required to be a modern emergency hospital. The spirit of the place was dedicated and proud. We would have been hard pressed to provide better service to our wounded.

Two return trips to Vietnam within the last few years, along with discussions with former Marines on the internet, by phone, and in person, have helped me rediscover the special unit where I served, and also perhaps a bit about myself.

It's easy to find the former hospital site. Before you get to the Marble Mountains heading south, you pass a pagoda set back off the road, hidden by trees. This is the

Khuy Bach Pagoda, part of the Bac My An Village. The village consists of the My Da, My Thi, and Daman Hamlets. The Daman Hamlet was on the hospital's rear perimeter, and the Khuy Bach Pagoda was on its northern perimeter.

The village has since spread over the whole area where the hospital once stood. The pagoda sat just outside the concertina, as did the hamlet, and when I first arrived at the hospital there was a little foot path running along the concertina to the hamlet. Later it became more of a dirt road. Now it is paved. Facing the road and the old hospital grounds is a large red building, a museum to what was called Secret Area K20. That was the Viet Cong code name for the Bac My An Village, an active area of Viet Cong resistance. Inside the museum is a model of the area, showing the tunnels by the river where VC hid. The former Marine "gunny" on security for the hospital told me that they knew about the activities of the village. It is no surprise, since inside the museum is a map detailing the October 1965 attack on MAG-16 in which the hospital was also overrun. However, there is no indication of the hospital on either the map or the model.

Nonetheless, two old pictures of the pagoda, taken from the hospital grounds, hang under the gaze of a statue of Ho Chi Minh. I donated them to the museum on my first trip back. The curator of the museum was very excited by my old pictures, as they had none from that period. I also was able to speak to villagers who remembered the hospital and, in one case, had worked there.

NSA's withdrawal from the area began in May, 1969, with the goal of handing over its extensive facilities to the Vietnamese military. The hospital was completely turned over to Vietnamese Army control in May 1970, about a year after I left. I learned from the curator of the K20 Museum that it was dismantled some time after that, when the Army pulled out of the area. You can still see parts of the hospital in the old part of the hamlet: gate posts of felled telephone poles, cut in half, and concrete walkways cut up into paving stones.

A great irony for me is that it was not until my trips back that I got to know anything about the area. I had been to the village of Binh Ky, birthplace of the author Le Ly Hayslip, in 1969, while on a road sweep with a squad from Golf Company, 2nd Battalion, Fifth Marine Regiment. It was part of a sleepover, an invitation from their corpsman and the squad leader, and the closest I ever came to field duty. We spent the night at Tower Three, at

the intersection of the Main Supply Road and Binh Ky Road, in hostile territory south of the Marble Mountains.

But visits to the city of Da Nang were only made on official business. I made many of these trips, usually at night in ambulances, with wounded or sick civilians or Vietnamese military. Sometimes the trips took us to the civilian hospital downtown, a horrible place with shared beds and animals wandering the open wards. Sometimes the trips took us to the Vietnamese Army hospital in Cam Le, where during the day you could see numbers of soldiers and children on crude crutches, amputees.

At night these trips were particularly eerie, the streets deserted. In fact, even in the day you saw no Americans in the crowds of Vietnamese on the streets. The city was off limits to all but a handful of Americans. Those few had to carry special passes allowing them to be in Da Nang. Nearly all of the Navy personnel in the Da Nang area lived at the large Tien Sha base, and those who worked in the Da Nang area were transported to and from work in what we termed cattle cars. There were no open apartments you could rent. Any quarters in the area were guarded. There were no bars to visit except those on your base, and at night you stayed on your base unless you were on official business.

This flies in the face of the stories in Hayslip's *When Heaven and Earth Changed Places* and *Child of War, Woman of Peace*, which became the Oliver Stone pot-boiler *Heaven and Earth*. Hayslip tells of working at a Navy hospital in Da Nang city, guarded by Vietnamese

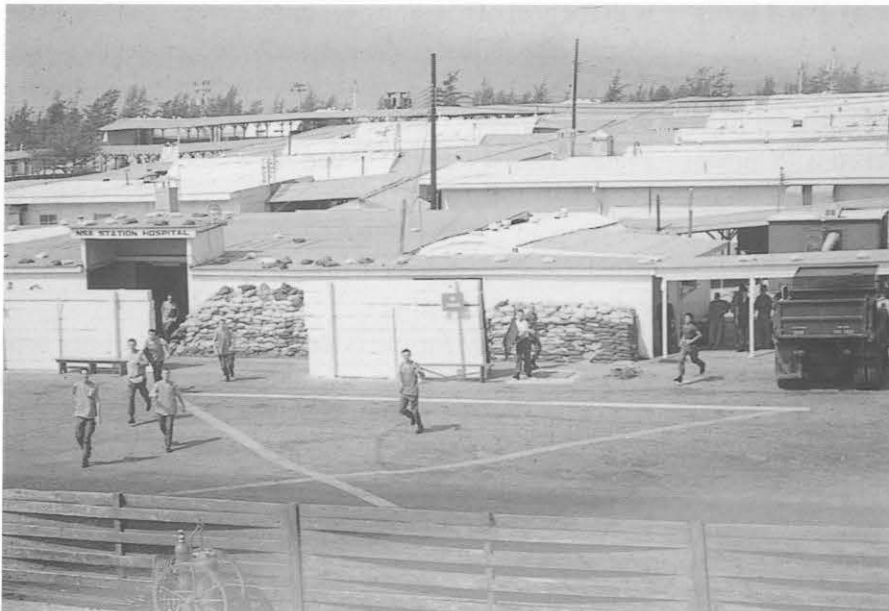
military personnel, that catered to Vietnamese civilians. There was no such hospital. NSA Station Hospital, which she refers to as My Thi Hospital, was the Navy Hospital in the area, and there were never Vietnamese military guarding it while I was there. She claims to have had an affair with a pot smoking Navy corpsman named Red who had an apartment across the street from the hospital where women came and went at will. Red supposedly tried to force her to work in a strip joint frequented by military personnel. Since Hayslip is writing about the period when I was there, from 1967 until 1969, I have to say that is pure fiction. It may be that something like that came to pass after the Navy gave the hospital to the Vietnamese military, as they were withdrawing, but I have yet to meet anyone who can verify it.

We treated numerous Vietnamese civilians and military at the hospital. However, Hayslip also claims she was treated at a military hospital as a civilian, in a dependent's clinic. That is far fetched, since military personnel did not have dependents with them unless those dependents also happened to be working in Vietnam in some capacity like press or Red Cross. We certainly had no dependent units, and treating women was a special problem since most of the wards were completely open with only a few private rooms and no segregated bathing or toilet facilities. There was no officer's ward, as I recall.

Marriage to Vietnamese nationals was simply not permitted except under very extreme circumstances. One interesting story is that of Duong Van Mai Elliot, author of

The Sacred Willow, who married an American army sergeant she had gone to college with, while he was working as a translator and she for the Rand Corporation in Saigon. He lost his security clearance.

We could walk or hitchhike the Main Supply Road to China Beach, north of the hospital, during the day, but we were not permitted to enter any buildings along the way. The short road from the Main Supply Road to



The hospital as seen from an incoming helo.

the China Beach USO went off limits about 6 months after I arrived, as it bordered a squatter's village we called Cabbage Patch harboring young thieves who would steal from those afoot.

For me, one memorable evening on my second return visit was sitting in a restaurant north of the Old American Bridge. Out over the water, eating a hot pot with eel and plenty of seafood, I just looked at the lights on the other side of the river, on the strip that was East Da Nang, and knew this was a formerly forbidden pleasure.

I broke another old taboo when I met a man a few years my junior on the flight to Da Nang from Saigon. He spoke good English and we hit it off when I tried my Vietnamese on him. He could barely control his laughter. He invited me to his home, near the Furama, in what had been Cabbage Patch. He had built it himself, and he worked in a rubber factory as a manager. One night we went to dinner at a seafood restaurant at My Khe, the beach north of China Beach where the 95th Evac Hospital, the subject of the series China Beach, had shown up some time in early 1969.

Near the northeast intersection of the Main Supply Road and the road to China Beach is a set of government buildings, where the Catholic orphanage had stood. The orphanage has been moved to Hoi An as a government facility, and the only reminder of our old MEDCAPs is the convent, where a handful of Vietnamese Catholic nuns are spending their last days.

At the end of the road to China Beach, near where the China Beach USO had stood, is the Furama Hotel. The Marble Mountains, which had once dominated the skyline, are now hidden behind buildings and billboards. The hospital has been gone for over 30 years now, a place whose physical existence lasted only about 4 years, but which has lived for decades in memory.

My own memories have lingered, though details have dulled. I recall how one night we got a Marine, his neck blasted with shrapnel, with a perfect tracheotomy, the metal tube neatly tucked in between scores of hemostats cutting off the bleeders. His corpsman accompanied him on the chopper to make certain the airway stayed open. The corpsman had been an OR tech who had seen dozens of tracheotomies performed, and besides his Unit One, he also carried a surgical kit. He had performed the surgery by flare light, while under fire, and the doctor on duty was amazed enough that he spread the word and his colleagues came to see the marvel. We put the corpsman up for the night, gave him a bottle of scotch and some

fresh surgical supplies, and he went back the following morning to his duty.

Amid deeper, sometimes painful memories, I also remember taking leaches we had removed from wounded Marines to the outdoor triage, injecting them with acetone and lighting them, watching them explode. Thirty years ago wasn't a time I wanted to remember, but now I cherish the memories. I was part of something acting in the world, making a difference at a time when no one wanted to hear about it. That makes it all the more special.

Some time after my second revisit to Vietnam, I found a message posted by a former Navy FMF corpsman on the internet. He described our triage and pre-op area from the casualty point of view. I wrote him an e-mail and he responded. We had a discussion by e-mail and he left me a phone number. I called him. He had come through our triage during my tour, though I probably did not work on him. The circumstances are special enough, however, that I believe I remember my good friend Bob Garrison talking about it.

The corpsman had stepped on a booby trap while treating a wounded Marine. He sustained the following wounds: traumatic amputation left leg below the knee; deep shrapnel wounds to the left thigh; massive shrapnel wounds to the right ankle; multiple shrapnel wounds to the groin, including both testicles, with half the left testicle removed; massive shrapnel wounds to the left arm including a severed radial artery; shrapnel to the right eye, still there. He says he regained consciousness after we got an IV going, yelling at someone to cut the damned leg off, not aware that it was gone until he sat bolt upright and looked down at the mangled remains. He probably would have died had there not been a Huey gunship in the area that picked him up and got him to us within minutes. He lived. In fact, he has lived a very productive, full life, with a family, a career, and a mission as counselor for a church.

Our conversation was not long, but it moved me. After 30 years I had found someone who lived because of us. It was always in the back of our minds, just how those who were horribly mutilated would consider us, those who had saved them? This former patient and fellow Navy hospital corpsman remembers the Station Hospital and was glad we were there. □

Mr. Chaffee resides in Austin, TX.

Khat

Exposé on the Horn of Africa's Drug of Choice

LT Youssef H. Aboul-Enein, MSC, USN

In 1992 "Operation Restore Hope" was in full swing spurred on in part by the battles of two sub-clans for the control of Mogadishu, the Somali capital. Many within Navy medicine serving aboard amphibious vessels or with the Marines on the ground may remember the atmosphere of the city. In his 1995 book entitled *Losing Mogadishu, Testing U.S. Policy in Somalia*, Jonathan Stevenson devoted a few pages to a drug known in the region as Khat (pronounced "cot"). He describes how the warring clans used khat, a plant that is chewed like plug tobacco, as payment and in order to suppress the appetite of the so-called guns for hire in this civil war.⁽¹⁾

In Riyadh, the Saudi capital, Khat leaves are openly sold in the Yemeni, Somali, and Ethiopian communities despite its ban in the country. The Saudi market primarily caters to expatriates from Yemen and Somalia who work in Saudi Arabia. The purpose of this article is to highlight this drug, as Navy medical personnel are more increasingly involved in low intensity conflicts that feature unique cultural and healthcare challenges.

What is Khat?

Khat is a type of amphetamine, a form of "speed" and a natural stimulant found in large shrubs growing in East Africa and southern Arabia. The leaves contain traces of cathinone, and typically premium prices are paid for freshly

cut leaves, as the potency of the drug diminishes with each passing day (www.paradigm.uor.edu).⁽²⁾ In Somalia, the "Technicals," gun-totting teenage thugs that made the rules in Mogadishu, chewed the plant incessantly.

Khat produces euphoric effects shortly after chewing, suggesting absorption through oral mucosa. The high usually lasts from 2 to 4 hours.⁽³⁾ After 4 hours, depression, fatigue, and a sense of heightened awareness occurs and is usually accompanied by insomnia. In Mogadishu, there was a direct correlation to the level of violence on the streets and when and where the Khat leaves were distributed and obtained. Stevenson recalls, "As the day wore on, restless adolescents got more and more cranked up and less and less rational. By late afternoon, the jangled nerves and raw tempers started to show up as reckless driving, senseless arguments and exchanges of gunfire."⁽¹⁾

Apparently, the Khat users tended to get their main amphetamine dose in the evenings. In a typical khat session, large cushions are laid out and water, cigarettes, and fresh khat leaves are strewn over a carpet. In Yemen, the hooka pipe is prepared and the leaves are chewed like tobacco. Lately, some users ingested pesticide from unwashed leaves causing illness. **M'bowder**, literally powdered, refers to street vendors caring enough to mention such khat to buyers.

The Culture of Kayf

In East Africa and in Yemen where the leaves are legal and are part of weddings, funerals, and social gatherings, you will find merchants and users trying to achieve Kayf. There is no English equivalent for the word, but it refers to the right mood. Kevin Rushby best describes *Kayf* as overtones of introspection and melancholy. In his 1999 book *Eating the Flowers of Paradise*, Rushby recounts his experiences along the Khat route from the Ethiopian highlands to the border of Yemen and Saudi Arabia. The author points out the nuance of Arabic and Amharic words in describing a khat transaction, and then during and after a khat-chewing session. He brought alive terms I had not encountered since my childhood growing up in Saudi Arabia.(4):

Raazim: The Khat Monster. A sprig of the leaf under the pillow is said to ward him off. Raazim refers to the psychological addiction of the drug during withdrawal or when symptoms wear off. It also could denote the state of euphoria created by the drug. It must be highlighted that unlike cocaine, khat does not produce a paranoid delusional state.

As-saa'a as-Suleimanyia: A Yemeni term, it literally means Solomon's Hour—after sunset. Khat sessions usually begin after 3 in the afternoon.

Khat types are named by region but the names Rushby most commonly uses are:

Rada'i: Found in southern non-khat regions. Not the best type of leaf, usually tough.

Sahmi: The best type of khat found in Hodeidah, Yemen.

Yafa'i: Another highly potent strain found in Aden.

Muqawat: Refers to the khat seller.

Treatment

Successful inpatient detox has employed doses of bromocriptine, desipramine, and thioridazine. The process took 1 to 2 weeks and follow-up continued for 6 months. (paradigm.uor.edu/user/doktor/dat.html).(5) The State of New York Office of Alcohol and Substance Abuse (OASAS) published a report in 1993, which noted an increase in khat use in the upstate New York area. The report particularly highlighted Fort Drum and surrounding areas which saw returning soldiers of "Operation Restore Hope" in Somalia. Use has also been noted among British forces serving in Aden when it was a British colony, and in Egyptian troops engaged in the 5-year Yemen War from 1962-1967.

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Bales of khat about to be loaded aboard a plane at a bush airport in East Africa.

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Photo by VADM Michael L. Cowan, MC, USN

A Quick Reference Guide to Dietary Supplements

CDR Bruce A. Barron, MC, USNR
LT Brice R. Nicholson, MC, USNR
LT Joseph E. Strauss, MC, USNR

Dietary supplements refer to a wide variety of products made from one or more essential nutrients such as vitamins, minerals, proteins, herbs, botanicals, amino acids, and pharmaceutical synthetics such as androstenedione. These agents are available in many forms including liquids, chewable bars, tablets, capsules, powders, softgels, and gelcaps. Although in the past these products were sold primarily in health food stores, marketing strategies for this multibillion dollar industry have changed and supplements can now be purchased in grocery stores and drug stores, through mail-order catalogs, and through the Internet.

Most dietary supplements contain natural substances and as a result, many people automatically assume these agents are inherently safe. In 1994 Congress passed the Dietary Supplements Health and Education Act (DSHEA). DSHEA classified herbal medicines and ergogenic aids as dietary supplements. Although marketing strategies may mimic advertisements for products approved by the Food and Drug Administration (FDA), DSHEA does not permit manufacturers to make therapeutic claims. DSHEA does permit supplements to be labeled, marketed, and sold as having healthful or nutritional properties. Therefore, dietary supplements are not subject to FDA approval prior to marketing, and manufacturers are not required to notify the FDA of label claims until 30 days after their products have reached the market. Additionally, manufacturers are not required to perform pre-market testing for side effects, drug interactions, product efficacy, or consistency. As a result of this lack of regulation, active ingredients may vary widely across different batches and different manufacturers. Contamination with environmental pollutants, deliberate addi-

tion of adulterants, misidentification, and mislabeling of products have all been reported in the literature.^(1,2)

Several studies have demonstrated a steady increase in the use of dietary supplements among the general population. In 1996 approximately 50 percent of the general population and 76 percent of college athletes reported use of supplements.⁽³⁾ During the past decade, stores selling dietary supplements have also emerged on many military bases in the U.S. It is not surprising that entrepreneurs of dietary supplements have targeted the military population since special forces, i.e. aviators, divers, SEALs, surface/subsurface warfare personnel, etc., are required to maintain a high state of mental and physical readiness. One study reported current dietary supplement use in 64 percent of U.S. Army Special Operations candidates.⁽⁴⁾ The majority of these soldiers reported taking supplements to promote general health and enhance performance.

Most Navy health care professionals (NHCPs) are cognizant of the increasing popularity and use of dietary supplements and ergogenic aids among Navy/Marine special forces. These high performance individuals, due to their desire to excel, combined with the common perception of "if some is good, more is better" are at increased risk of toxicity secondary to excessive consumption of these products. Although many of these individuals are well informed on health issues, some members of this group will either formally or informally consult NHCPs regarding the efficacy and risks associated with the consumption of these products. This poses a challenge to most NHCPs because dietary supplements have only recently become popular in the U.S. and they are not regarded as drugs under the FDA; therefore, it is unlikely that NHCPs have had any significant formal education or

training regarding the indications, dosages, contraindications, and toxicities of dietary supplements. This problem is compounded by the fact that, until recently, there has been very little information published in the scientific literature regarding side effects, drug interactions, and product consistency. Therefore, the goals of this article are to develop (1) a quick reference guide to dietary supplements most likely consumed by operational forces and (2) a list of references that are readily available to operational NHCPs throughout the world.

Dietary Supplements

Some elite forces in the Navy are subjected to restrictions regarding the use of prescription and over-the-counter medications. Although surface and underwater personnel do not have specific instructions prohibiting the use of dietary supplements, naval aviators and aircrew are not allowed to use dietary supplements or herbal medicines as per the Navy Manual of Medicine (OPNAVINST 3710.7R Chapter 8.3.2.5). Despite these regulatory instructions, widespread use of dietary supplements among flight personnel is a concern because of the current popularity of supplements and the high performance characteristics of this group of individuals. Until the Naval Aerospace Medicine Institute approves the use of dietary supplements in aviators and aircrew, the products discussed in this article are restricted to surface and underwater personnel. Table 1 lists (alphabetically) some of the most common dietary supplements encountered in the authors' clinical practices and provides information on their indications, typical dosing, and possible side effects.(5-14) Table 1 is neither an exhaustive list nor a comprehensive review of the subject; rather it is meant to serve as a quick reference guide to NHCPs practicing in a busy clinical environment.

It is important for NHCPs to remember that military members often obtain information regarding dietary supplements from colleagues, gym partners, Internet resources, and popular magazines, instead of consulting a physician or allied health care provider. The information obtained from these alternative resources may consequently be inaccurate or misleading. Therefore, when questioned by a patient about a specific supplement, it is important for NHCPs to have access to current and accurate information. Table 2 offers a list of Internet resources that may be used to find pertinent information regarding most dietary supplements available on the market today. These websites provide valid and reliable information that can be accessed by NHCPs practicing

afloat or ashore throughout the world. It is worth noting that NHCPs should use the FDA website to report adverse reactions related to over-the-counter dietary supplements in their patient population.

In a study reviewing supplement use in a military population it was determined that up to 81 percent of those studied used more than one supplement at a time.(4) Many of the listed supplements are generally regarded by the medical community as being safe if used under the right conditions and at the right dosages, but oftentimes an individual will combine two or more products that can greatly increase the risk of adverse reactions. This should be a key point in educating personnel who continue to use health and performance supplements. For example, the use of creatine along with other ergogenic supplements should be highly discouraged. Many individuals use creatine to enhance the body's performance both during endurance and resistance strength training, although studies show that it is more effective primarily during resistance strength training.(15) Several case reports have shown that even moderately dehydrated individuals taking creatine have been hospitalized for the treatment of acute renal failure. While creatine may help create more muscle mass it is important to remember that this increased mass requires more energy, and as such may have deleterious effects on an individual's aerobic capacity. If an ergogenic supplement such as ma huang (ephedra), which is known to cause systemic vasoconstriction to the point of inducing strokes, is used concomitantly with creatine the likelihood of renal damage may be synergistically increased in a moderately dehydrated individual.(5) A performance mixture, such as MET-Rx, might be a good alternative for those who take separate daily doses of vitamins, chromium, and other ergogenic supplements. MET-Rx is packaged as a fixed dose that can be mixed with either water or milk to provide the desired caloric intake. Although it is somewhat expensive, there have been no documented adverse reactions to short or long-term usage of this supplement.

While there are many articles that discuss the potential adverse reactions associated with supplements such as creatine and ma huang (ephedra), some seemingly harmless products nonetheless have inherent medical risks associated with their use. Vitamin A is known to cause liver toxicity when taken in large amounts. St. John's Wort has been noted to have severe interactions with certain prescription drugs, especially those that are MAO inhibitors.(8,10,11) Vitamin E can cause a prolonged bleeding time and echinacea is contraindicated in pregnancy.

TABLE: POPULAR DIETARY SUPPLEMENTS			
SUPPLEMENT	COMMON USE/INDICATIONS	DAILY DOSE	SIDE EFFECTS/PRECAUTIONS
Calcium	Prevents osteoporosis, prevents bone catabolism and lowers blood pressure	1000-1500 mg	Depression and nephrolithiasis (5,6)
Chromium	Improves glucose tolerance and decreases cholesterol levels	50-200 mcg	Altered dream state and gastric irritant (5,6)
Creatine	Increased physical endurance and muscle mass	Loading dose: 20-30 grams for 1 week. Maintenance dose: 5-15 grams	Acute renal failure, seizures, and cramping (6,7)
Echinacea	Stimulates immune system and accelerates wound healing	6-9 mL (fresh juice) or 1.5-7.5 mL (tincture) or 2-5 grams (dried root)	Contraindicated during pregnancy and in autoimmune disease, rash, pruritis, and dizziness (5,8,9,10)
Garlic	Lowers cholesterol, anti-cancer activity and anti-inflammatory	0.4-12 grams (powder) or 2-5 grams (fresh bulb)	Decreased platelet function, prolonged bleeding time, gastrointestinal upset, gas, reflux, and nausea (8,9,10,11)
Ginseng	Decreases fatigue and increases immune response	1-2 grams (root)	Sleeplessness, nervousness, hypertonia, hypertension, edema and possible interaction with warfarin (5,8,9,10,11)
Glucosamine	Reduces joint pain and promotes cartilage repair	500-1000 mg up to three times per day	No serious side effects reported, may cause gastrointestinal upset and may interfere with glucose tolerance (12)
Ma Huang	Stimulant and control of mild reactive airway disease	15-30 mg (calculated as ephedrine)	Stroke, seizures, and avoid concomitant use with MAO inhibitors (5,6,8)
Melatonin	Sleep aid and prevention of jet lag	5 mg 30 minutes before sleep	Interaction with antihypertensive medications and headache (8,13)
Pro-performance mixtures	Increased physical endurance and muscle mass	72 grams with water or milk up to two times daily	No serious side effects reported
Sports bars	Increased physical endurance and increased muscle mass	1 bar with meals or before/after exercise	No serious side effects reported
St. John's Wort	Anti-depressant and skin anti-inflammatory	300 mg three times per day or 450 mg two times per day	Possible severe interactions with several prescription drugs (8,10,11)
Vitamin A	Acne treatment, enhanced night vision and anti-cancer activity	5000-25,000 IU	Liver dysfunction, headache, cerebral edema, altered mental status, dermatitis, and birth defects in high doses (6,14)
Vitamin C	Reduces coronary atherosclerosis and enhances immune response	500-1000 mg	Nephrolithiasis, hemolysis, diarrhea, gas, and bloating (6,14)
Vitamin E	Reduces coronary atherosclerosis and decreases fibrocystic breast disease	(standard extract) 400-800 mg	Prolonged bleeding time and hemorrhaging (6,14)

(5,6,10,14) For this reason it is imperative that NHCPs educate personnel regarding the appropriate and safe use of dietary supplements.

Conclusions

Table 1 provides a brief summary of dietary supplements that operational NHCPs are likely to encounter while treating their patients or during periodic health examinations such as annual flight physicals. Elite operational forces, not unlike athletes, have a tendency to use supplements at high rates because of their belief in performance enhancement through nutrition. The consumption of these products must be tempered by the lack of proven efficacy and the risk of toxic effects at high doses secondary to inappropriate use, which may paradoxically lead to performance degradation rather than enhancement. The lack of FDA oversight on manufacturing in conjunction with varying concentrations and substance purity serves only to increase the risk of toxic effects and concern from an operational perspective. Since these products are oftentimes not regarded as drugs or medications, NHCPs should ask their patients if they are taking any vitamins, minerals, dietary supplements, diet aids, or ergogenic aids during medical examinations to facilitate disclosure.

Once disclosure has been ascertained, operational NHCPs need access to valid and reliable information when counseling special forces. Steps the NHCP should consider when discussing or recommending dietary supplements include: (1) BUMED instructions regarding the use of these products by special forces and other operational personnel, (2) effectiveness of the supplement as demonstrated in well-designed clinical trials, (3) abuse potential, side effects, and drug interactions and (4) product quality and reliability as it relates to manufacturing, standardization, and labeling. It is suggested that the Navy create and maintain a website useful to both NHCPs and military members regarding dietary supplements in order to facilitate responsible prescription and use of these products and to minimize adverse impact on health, performance, and operational readiness.

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TABLE 2: INTERNET RESOURCES

www.aafp.com
www.aviationmedicine.com
www.fda.org
www.herbalgram.org
www.med1.com
www.naturaldatabase.com
www.pdr.net
www.rxlist.com

Feeling the Sound Can Be Dangerous to Your Health

COL Bart P. Billings, MS, South Carolina National Guard

Long term exposure to excessive levels of high intensity low frequency (HI/LF) sound such as that produced by highly amplified bass music, aircraft, racing cars, battle-field noise, etc., is not only physically harmful, but can cause complications resulting in death.

As a parent, I have often heard myself repeat what my parents preached to me: "Turn down that music. It's too loud." About a year or so ago, I heard myself say it in a large sports arena being set up for a rock concert. The sound was actually painful to the point of my yelling, "Turn it off; it hurts!"

I recalled something I read many years ago about endorphins and a runner's high. In his book, *Positive Addiction*, the prominent psychiatrist-educator William Glasser states that people who run frequently experience physical pain from joint trauma caused by running. When this occurs, the brain signals for endorphins and adrenaline to be released into the blood, anesthetizing the runner and enhancing performance. The natural pain killer—endorphine—acts like a narcotic, dulling the pain, but also causing what is called a runner's high. This high may result in temporary disorientation causing the runner to become oblivious to his/her environment, resulting in a collision.(1)

Neuroscientists say a high caused by the release of endorphins in the brain results in euphoria. Endorphins and enkephalins are concomitants of the "fight or flight" response. They are pain-blunting, pleasure-enhancing, morphine-like chemicals whose purpose is to make the body more effective. But in certain situations, when not related to a "fight or flight" situation, they can have a negative effect.

Since sound waves penetrate the body, cellular structures throughout are damaged. Although medical profes-

sionals have known for years that HI/LF sound clinically affects auditory and balance functions, its effects on other body systems have not been emphasized.

The current work of Castelo Branco of the Center for Human Performance (Neurological Services of Capuchos Hospital) in Lisbon, Portugal, is worth noting. He has shown that the effects of long term exposure to HI/LF noise and vibration lead to what is called "Vibroacoustic Syndrome." (2) Branco's research points to visual problems, epilepsy, stroke-type neurological deficiencies, and psychic disturbances, i.e., anxiety, depression, and hostility.

Patients diagnosed with vibroacoustic syndrome have an increased risk of thromboembolism. He also discovered central nervous system lesions, vascular lesions with predominant involvement of peripheral small arteries (internal thickening) in almost all areas of the body. Patients have also displayed some degree of mitral valve and pericardial abnormality. Also, malignancy is significantly increased, as well as the presence of other physical symptoms.

Obviously, the degree of exposure to HI/LF sound and vibration determines the level of damage. In Branco's research, high levels of sound frequently exceeding 110 db at low frequency bands below 100 Hz, were registered in environments occupied by individuals diagnosed with vibroacoustic syndrome. (Hz reflects sound frequencies ranging from bass lows to high end sound.) Whole body sound vibrations have been known to be a stressor, to cause homeostatic imbalance, and disease.(3,4) Prolonged exposure to whole body vibration and sound is also known to interfere with human behavior and performance.

Nervous system impulses occur serially and may be described as frequencies. Much the same applies to the

active muscle system which is actually in a state of vibration. It is in this vibratory field that all bio-electric chemical, mechanical, energetic, thermal, structural, kinetic, and dynamic processes take their course.⁽⁵⁾ Therefore, when the natural course of frequencies and vibrations are altered by external HI/LF sound waves that penetrate the total body system, the potential for a breakdown in normal body functioning become obvious.

In his research, Orr found that, "low frequency sound pulses, at or near a person's heart rate, seem to cause the human system to lock in to the sound generator."⁽⁶⁾ Once this occurs, changes in the frequency or rate of sound causes corresponding changes in the person's heart rate, as well as changes in other physical functions, a process known as entrainment. In the realm of video games, those games with the best graphics are not the most popular. Those with a low frequency pulse, near the heartbeat rate, and that accelerate as the game progresses, are played more often. Try to recall the last time you went to an action movie. As the action progressed and the low frequency sound increased in speed and intensity, you were soon on the edge of your seat with an elevated heart rate and blood pressure. If there were a sudden loss of audio but with the video remaining, the physical effects were less dramatic. Thus, when auditory entrainment increases heart rate with an accompanying production of adrenaline and endorphins, the end result of the movie or video game is the same. The person is "hyped" and wants more.

Could this type sound be addictive as is the high experienced by Dr. Glasser's runners. If a runner misses a day or two of their sport, he or she experiences symptoms similar to drug withdrawal, Glasser's concept of positive addiction. Therefore, if one becomes addicted in a concert setting to the natural high experienced by HI/LF sound-induced damage, will this addiction persist, and will the subject also be susceptible to boom boxes, high powered speakers in the home, and other noise producing sources?

If there is addictive potential for HI/LF sound to cause disorientation, which is consistent with endorphine and adrenaline release, can automobile safety be compromised when people play HI/LF music in their cars?

Psychologists Helen Beh and Richard Hirst of The University of Sydney have investigated whether loud music interferes with driving. They discovered that "responding to objects intruding on their peripheral vision, people subjected to 85 db rock music were about 100 milliseconds slower than the other groups" in their study. Since many road hazards emerge from the periphery, drivers listening to loud music are less safe.

A Navy occupational medicine physician once told me he was curious why Sailors who work on the flight decks of aircraft carriers occasionally walk off the edge, and for no apparent reason, even though they had protective gear for their head and ears. I explained that long exposure of the entire body to HI/LF noise from jet engines presents many opportunities for confusion and disorientation. Head gear alone cannot wholly protect an individual from sound waves penetrating the brain and the rest of the body. Without additional protection, there is constant damage to cells, resulting in ongoing fatigue.

I interviewed Sailors who worked on aircraft carrier flight decks. Their input was consistent with what one carrier crew chief told me about his experience. He frequently observed fellow crewmembers becoming disoriented after long exposure to HI/LF sound from jet engines. He described several situations:

(1) The noise and pressure from an F-14 were strong enough that on take off, it felt as if a large vibrator was placed on your chest. Flight deck crews would purposely stand as close to the catapults as they could to feel the power of the planes. (Addictive behavior)

(2) Most every accident that took place was the result of personnel not paying attention. An experienced member of the flight deck crew once walked in front of the right engine intake of an F-14 while the engines were running. His protective helmet was ripped off his head and sucked into the intake, ruining the engine. The worker, who then ran off the flight deck, was found in a corner several hours later shaking and crying. (Disorientation)

(3) "Working the flight deck was the most exciting thing I've ever done, but I also hated every second of it. Once the planes left the flight deck on flight operations, there was always a let down, kind of like coming down from a drug high. Once the planes returned, your energy level quickly increased." (Addictive behavior) (7)

The crew chief's experience reminded me of a concert I recently attended. For 2 hours I was subjected to high intensity bass waves pounding on my body. Toward the beginning of the show, I actually felt nauseous and somewhat disoriented, but after my body adjusted, the feeling passed. I felt unusually tired the next day.

This experience is consistent with cell damage inflicted by the sound waves on the body. Although the total time of exposure was minimal, the effects were lasting.

I discussed these observations with a professional counselor who felt he had experienced what I described when he was younger. He stated that he attended many extremely loud concerts and described how he and his friends would stand next to the speakers and feel high,

but at the same time could only tolerate the exposure briefly and retreated to recuperate. After some time away, they would again stand in front of the speakers (similar to the deck crew on the aircraft carrier). This would occur several times during the performance. Afterwards, when at home, he was exhausted, and had balance problems for days. Although all the above is anecdotal, these experiences are worth noting.

An engineer explained that you can only hear low frequency down to a certain level and anything below that is not really heard but felt. What occurs below this level is a pressure change that can be felt by the body. HI/LF sound becomes even more damaging when it contains HI/LF harmonics (multiples of frequencies) that can cause rapid physical displacement. This can approximate the effects of an explosion. Therefore, at extreme high intensity of low frequency alone, the damage is not as great as when there are rapid changes, either boosting the amplitude (sound level) or dropping it rapidly. Most damage occurs in this situation, and at extremes. Like an explosion, it can kill.

This variable sound level is consistent with highly amplified concerts to the extent that some concerts use actual explosives as special effects. Some performances of *The 1812 Overture* is a case in point.

At extreme HI/LF sound levels, the body can experience nonauditory effects i.e., (1) physiological responses and health outcomes other than hearing loss, (2) performance and behavioral effects, (3) sleep disturbances, and (4) communication interference. These effects would appear to comprise a generalized stress reaction governed by sympathetic activation of the autonomic nervous system, with the physiological and hormonal changes produced by the sound appearing similar to those produced by other physical impacts. Based on existing data, the association between high sound levels and elevated blood pressure is also common. Studies by Medoff and Bongiovani (1945) and Buckley and Smookler (1970) found elevated blood pressure as a result of exposure to several months of intermittent sound.(8,9)

Another 1981 study by E.A. Peterson, J.S. Augenstein, D.C. Tanis, and D.C. Augenstein, using Rhesus monkeys found elevation of blood pressure during 9 months of moderately high sound levels (85 db).(10) Blood pressure did not return to pre-existing levels during a month of post-exposure quiet. Also, the blood pressure changes were produced in the absence of appreciable permanent hearing loss. This strongly suggests that non-auditory effects may occur at levels below those which are damaging to hearing.

Work by Cantrell in 1974 also indicated elevations in cortisol (a stress hormone) and cholesterol when one is exposed to 30 days of short bursts of sound at 80 to 90 db levels.(11) These cortisol and cholesterol levels decreased upon sound cessation, strongly indicating the effects were sound induced. At the International Society for Neuro-immunomodulation Conference in November 1996, Dr. Philip Gold of the National Institute of Mental Health stated: "In many people, their hormones, such as cortisol, turn on and stay on for a long time. If you are in danger, cortisol is good for you. But unregulated, it can produce disease. In extreme cases, this hormonal state destroys appetite, cripples the immune system, shuts down processes that repair tissue, blocks sleep and even breaks down bone."

When using electro-encephalograms (EEG) to measure "brain wave frequencies" we find that at any given time, our brains produce distinct wave forms in four frequency groupings, beta, alpha, theta, and delta. The beta state, (the dominant set of frequencies) is associated with alertness, with the highest frequencies in that range often described as "fight/flight" mode. Alpha frequencies are often associated with meditation and relaxation while theta is associated with dreamy, creative states. Delta waves are strongest when you are asleep.

A specialist in bio feedback training indicated that individuals who are experiencing HI/LF sound are most likely to be, for the most part, in hyper beta and would be hyper vigilant. Since this state is difficult to sustain over long periods, it is not unusual for the brain to jump to theta state directly as a protective measure. Since theta is associated with dreamy states, there is the possibility for disorientation and confusion. This may account for poor judgment when one is exposed to HI/LF sound for sustained periods. This situation, in conjunction with actual brain cell damage, results in a less and less effective person and one subject to accidents.

What effect does HI/LF sound have on the fetus of an expectant mother and on pre-school age children, particularly from birth to 3 years old? As this is a time of rapid brain cell formation and the development of neural networks that will serve a lifetime of cognitive activity, what impact might HI/LF sound waves have on the infant's developing brain? Since the HI/LF sound can cause cell damage, what would occur if the expectant mother were exposed to destructive levels of HI/LF sound? Birth defects resulting in brain damage (mental retardation, cerebral palsy, etc.) cannot be ruled out.

There have already been studies reporting that children may be very susceptible to noise (HI/LF sound), and

that given noise levels may produce greater effects than would be predicted on the basis of previous studies of adults.(12) One of the studies described by Hans Lou, et.al., indicates that HI/LF is a stressor that significantly affected birth weight and head circumference.(13) When birth weight was corrected, stress remained a serious determinant of small head circumference, indicating a specific effect on brain development. Therefore, it would appear that expectant mothers should be warned to avoid environments where there is significant exposure to HI/LF sound.

With all the physical problems associated with HI/LF sound, why do human beings expose themselves to sound that is obviously painful? If we truly lived in a Stimulus-Response (S/R) world, then one would automatically withdraw from a painful experience, such as removing one's hand from a hot stove. Although most people believe that behavior is externally motivated, this may not be the case. Glasser best explains human behavior in what he describes as a "Choice Theory Psychology." He theorizes that human beings will put themselves into situations counter to a S/R situation because of internal motivations.

Consistent with this observation is a study (Fearn, 1972, 1973,) that indicates that young people who regularly attend dance clubs and pop concerts show deafness which is dose-dependent upon the frequency of the exposure.(14) Again, if hearing loss is occurring in these situations, then the damage (vibroacoustic syndrome) is occurring throughout the body, varying to the degree of exposure. As with other addictions, one may actually be subjecting themselves to physical damage and continue on with the addicting behavior.

None of this, of course, is an indictment of music. Indeed, quite the opposite is true. We have all heard that music soothes the savage beast. There is music therapy, bio feedback for relaxation, and many other forms of calming music including vibroacoustic therapy. What is dangerous is that which lurks at the other end of the spectrum. It is the music that hurts, enrages, and triggers fight or flight brain reactions, resulting in physiological changes that are harmful. As N'omi Orr once stated, "Military drums play music designed to make your feet take you where your head never would—Music is almost as dangerous as gunpowder."

The protective survival to HI/LF sound causes blood pressure to increase and heart to beat faster so oxygenated blood can be pumped to the muscles to fight off the perceived saber tooth tiger. The blood thickens so that if scratched or bitten in the battle, one won't bleed to death (cholesterol increases since it is a thickening agent to stop

bleeding). One experiences hyper brain wave activity to be more vigilant, the palms of one's hands get sticky to better grasp the club to beat off the beast, and the bottoms of one's feet get sticky for better traction to run away and escape the attack.

But if we aren't physically fighting or fleeing, then what effect does all this physiology have on the body when we are subjected to HI/LF sound in our cars, at a concert, or in a home environment? To varying degrees, the body responds in a way that may be adverse to our health. "Killing me loudly with his song, killing me loudly," a rearrangement of a popular song, is a reality worth considering.

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A Ray of Light

Did you know that light has the power to heal? It does when it's combined with a special light sensitive drug used to treat skin cancer tumors and inflammatory diseases such as psoriasis and chronic dermatitis. This unique procedure is called photodynamic therapy and it's a first for military dermatology and Naval Medical Center San Diego.

Photodynamic therapy is a less invasive treatment when compared to its counterpart treatment of cutting and burning a tumor out of the skin, which leaves big visible scars and holds the risk of infection. "This treatment is very clean and it involves no cutting of my skin," said Terry Waldenmaier, retired lieutenant and the first patient treated with laser therapy at Balboa. "The scars are clean and hardly visible which is a plus for me since I already have scars from getting them [the tumors] cut out."

Waldenmaier has Basal Cell Nevus Syndrome, a form of skin cancer, which produces many superficial skin tumors. He's had over 200

tumors treated with both therapies. "I'm excited about being able to get this treatment here," he said. "Before, I've had to travel to Buffalo, NY, for this treatment and I think it's wonderful that the military is able to do it now in my backyard."

Photodynamic therapy works when a light sensitive drug called Aminolevulinic Acid (Levulan) is mixed with a regular skin cream and applied to the skin where the tumors are located. The cream mixture stays on the skin and is covered with a bandage for 6 to 24 hours.

After the cream is absorbed it creates a red fluorescent glow to the applied area that can be seen with a black light. The laser is aligned to the area of treatment and a red beam of light (630 nonometers) activates the drug and pulls the red out of the skin cells. "The drug, when activated, kills only the bad cells. The normal cells are not harmed," said CDR E. Victor Ross, Residency Program Director of the Dermatology Department at the Medical Center. "Most of the time the cells are destroyed permanently and any left over cells that weren't de-

stroyed completely will usually be killed by the patient's immune system."

According to Ross, the real benefit to this treatment is that a broader area of the skin can be treated at one time without having to cut into the skin and damage normal cells. The laser treatments last about 15 minutes and the patient is healed in about a week, whereas cutting and sewing is a longer procedure with an extended healing time.

There is some pain associated with the procedure. Some patients say it feels like having a bad sunburn, while others feel like their skin is touching a hot stove. The patients do receive an injected local anesthesia to minimize the pain, but according to Waldenmaier, the benefits outweigh any pain that is felt. "I've been treated since 1985 and without this laser treatment they would have had to continue to cut and burn the tumors out, leaving even more scarring."

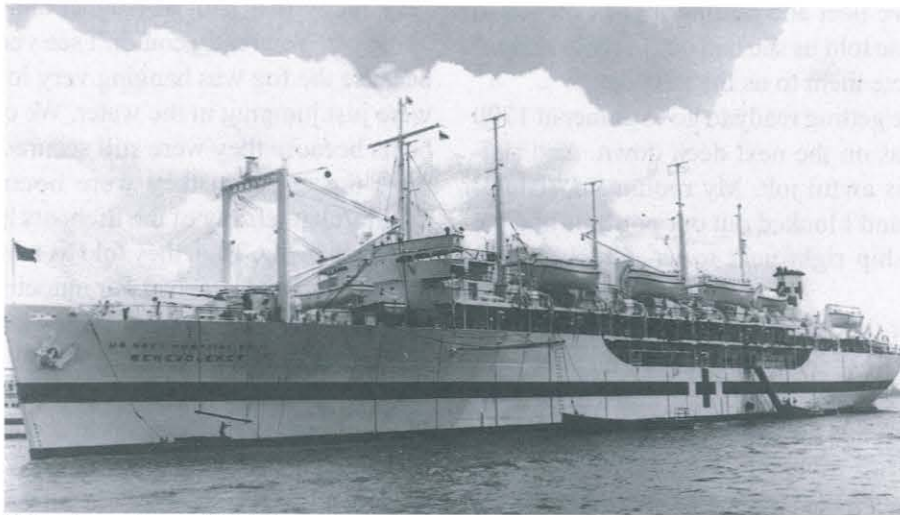
CDR Ross believes photodynamic therapy has more benefits. "This therapy is not just limited to dermatology. It has a lot of potential and we will keep researching to see in what other areas it can prove beneficial." □

—Story by JO1 Sonya Ansarov, Naval Medical Center San Diego Public Affairs

Benevolence Survivor

On 25 August, 1950, prior to her upcoming departure for Korea, the USS Benevolence (AH-13) was returning from a shakedown cruise in San Francisco Bay. About 4 miles from the Golden Gate, the outward bound freighter SS Mary Luckenbach suddenly emerged from the fog. The freighter's bow hit the hospital ship's port side, sliced through her thin steel plates, slid down the side of Benevolence and cut through the hull again amidships. The ship took an immediate list, slowly turned on her port side, and sank in less than half an hour. Of the 518 aboard, 23 perished. One of the survivors of the disaster, nurse ENS Dorothy Venverloh, recalls the incident.

LCDR Dorothy Venverloh, NC, USN (Ret.)



USS Benevolence (AH-13) as she looked at the close of World War II.

BUMED Archives

I was at Oak Knoll [Naval Hospital] on a surgical ward when we heard they were having troubles in Korea. My orders were dated the 25th of July 1950, and I and another nurse had to report to Mare Island Naval Shipyard because that's where the *Benevolence* was in mothballs. Our assignment was with the Reserve Fleet for temporary duty. We reported in and then lived in quonset huts on the base because the Mare Island hospital was officially closed 2 weeks before.

One of the hospital chiefs from the Naval Hospital in Houston was on duty there aboard the hospital ship so he showed us all around—above deck, below deck, the elevators, and then when we got down below where the hospital units were, he said, “This ship is not as seaworthy as some of the other ships.” I always kept what he said in the back of my mind.

The ship looked like it had been taken care of pretty well. Just as the wool blankets were preserved with camphor (moth balls), the remainder of the ship had been protected by spraying it with layers to protect it and to “co-coon” it when it was placed in the “Moth Ball” fleet.

I was very excited about being assigned to a hospital ship. That was one of the things one always thought about. This was choice duty for a nurse. I had come into the Navy in '47 and, of course, many of the experienced personnel had been released to inactive duty.

We were to go aboard earlier but couldn't because this was going to be the first ship that sailed with a Navy crew and a merchant marine crew. The merchant mariners had gotten there first, staked out their territory, and took over the staterooms. So they had to find a different place for them and get them moved out. We weren't too

sure just how this was all going to work out. It was said they were very resentful because when they had moved aboard no one had told them anything. Anyway, we finally got moved aboard.

The first day we were to go out on a shakedown cruise. Afterward, the plan was to return to Mare Island and load up with supplies. Then we were going to Korea to relieve the *Consolation*. We would have stayed on the ship that night before sailing for Korea the next day.

While still in Oakland Bay and before we got to the Golden Gate Bridge, the crew practiced using the distress flags and signaling that the ship was at anchor. Prior to this we hadn't yet had abandon ship or lifeboat drills. We didn't have them until after we moved aboard. On that shakedown cruise down the bay, we went to the officers' mess, where the captain read the orders taking the ship from the reserve fleet and putting it back on active duty. The Chief Nurse told us she had our lifeboat assignments and would give them to us the next day.

Anyway, we were getting ready to go to dinner at 1700 hours. Our mess was on the next deck down. And suddenly, there was this awful jolt. My roommate, [LTJG] Rosemary Neville, and I looked out our porthole and we could see another ship right next to us—the merchant ship that hit us.

Just minutes after that we heard over the loudspeaker system, "Prepare to Abandon Ship." They told us to take our life jackets and go to the side of the ship that was out of the water. The ship had begun listing very fast. By the time I went to go forward I had to walk with one foot on the deck and one foot on the bulkhead. My roommate ran out ahead of me. When we got to the door between our quarters and the cross passageway, there were men who had been up on deck and had come into the cross passageway to give us a steadying hand getting up the bulkhead that separated the nurse quarters from the cross passageway.

We did not know very much about what was going on. We knew the ship was listing and not stabilized. We were all so busy getting out of our quarters. There was someone who didn't take her life jacket and she wanted somebody to bring her one. Prior to this, most of the life jackets had been gathered and placed on another deck. They were to be sent out to be cleaned that very day so some people didn't have them in their rooms. But we had ours. We had thrown them on top of the metal cabinet in our stateroom.

The men in the cross passageway reached down, grabbed our hands, and pulled us up the bulkhead, helped

Benevolence rests on her side in 70 feet of water.



us through the doorway, and up the passageway. Then once we were on deck we sat on the railing to see what would happen next.

The weather was very foggy that 25th of August and the fog horns were going off. You really couldn't see very far over the water because the fog was hanging very low. Some of the men were just jumping in the water. We couldn't use the lifeboats because they were still secured. What did get over were the rafts but they were bouncing around. They couldn't launch any of the lifeboats because the ship was listing so badly. Then they told us to be sure to put our life jackets on. When we had our indoctrination course nothing much was said about putting on life jackets. You know, you put this thing on and then you wrap this long tape around you and tie the knot in it. Well, we had never been told that you were supposed to secure some of the straps between the legs. And, of course, we were wearing full skirts—uniforms. So most of us just tied the strap around our waist. Well, that resulted in difficulty later on when we were in the water because the life jackets had a tendency to ride upward and float over your head. We were never taught how to wear the life jackets. Maybe they assumed we should know by common sense. The men knew what to do with them but we didn't.

In the meantime, CAPT [Cecil] Riggs, the medical C.O., who was still aboard, had some of the men go around and get wooden planks to put into the water. Planks and coils of rope and round life preservers were available for "man overboard" drills. The idea was that we needed something to hang on to. While we were on deck, he ran the rope through the belt loops on the back of our coats. In fact, we were wearing everything—full skirted uniforms, hats, sweaters, coats, and purses. After all, we were going somewhere.

They finally told us to get off the ship and we had to navigate our way down the side. We finally stepped off



San Francisco Maritime National Historical Park

the bilge keel into the water. As we did so, we used the leg closest to the hull to push off. Then they told us to get clear of the ship because when it finally went down we didn't want to get sucked under.

We knew it wasn't a drill. You were really looking out for the other person, making sure everyone was together.

The boards in the water were pretty wide—about 18 inches or so—and quite thick. I had a death grip on the board I was holding on to. When the men on the ocean going tug finally pulled me out I couldn't bend my left hand for a good day. I was holding on to my roommate Rosemary with my other hand because her arms weren't long enough to reach the board. She was holding on to me and I was holding onto the board. Some of the merchant seamen were holding on to the opposite side of our board.

Nell [Senior Nurse Eleanor] Harrington was singing all kinds of songs. Then one of the girls finally said, "If I open my mouth again to sing, I'm swallowing too much water." Then she said to Nell, "And besides, I can't say my prayers while you are singing." So then Nell finally stopped.

The water was cold. I think we later learned that it was around 50 degrees. We also heard that had we been in that water just 10 minutes more, they would have pulled our bodies out. It was also rough. First we'd be down in a trough, and then we'd be way up, and then down. It was so foggy and we were so intent on holding on that we didn't see the ship go under. After a while we saw the captain's gig come up and one of the Sailors aboard said, "I can't take you aboard but I'll tell them where you are." Apparently, he had a tough time keeping the engine running.

About that time an Army Engineer tug appeared. They first took off the men clinging to the plank on the other side of us. When it was our turn, they told us to grab a hand so they could pull us aboard. We said we couldn't because we were all tied together. One of the men from

the tug jumped in the water and cut the rope between each of us so they were able to pull us individually up over the side of the tug. I would have been the last person pulled aboard except that [LT] Wilma Ledbetter didn't let them come near her. When the tug had first arrived the crew had fired a Very [flare] pistol over us and told us to catch the line. We were trying to do that but Wilma kept pushing them away saying they were going to drown her. She was very panicky. Several men then jumped in and tried to hold her up, but she wouldn't cooperate. So they turned their attention to me instead. When the waves washed me up high, two men who were hanging over the railing each grabbed one of my arms and pulled me up over the side.

Wilma, then, ended up being last. She continued to fight them as they tried to pull her out of the water and, by the time they finally got her aboard, her color was terrible, kind of a pinkish-blue, and she wasn't responding. She died aboard that tug boat, probably from hypothermia.

We then went below deck where it was very crowded. Soon thereafter, they brought the pilot down on some boards. We later learned that he had been thrown back against the wheel on the bridge and had seriously injured his back when the collision occurred. I don't think he survived.¹

They took as many people as they could aboard the tug and returned to the pier in San Francisco. At first, not all the nurses were accounted for. [ENS] Helen Wallis was with a merchant seaman who had survived several ship wrecks in the past. The ship that hit us pulled out survivors who were floating in its path. Helen was one of those and was brought to our ward at Oak Knoll some time later.

We were taken to Oak Knoll [Naval Hospital] on buses, where we were admitted. We stayed for several days and were put to work on the wards until all our paperwork was reconstructed. We lost all of that except for our pay records, which weren't aboard.

Some time later we had to go back to Mare Island for a closed meeting of the people who had been aboard the ship. We weren't supposed to talk to anybody about what was discussed. They told each of us that if there was someone we wanted to praise or condemn for their actions, that was the time to do it.

¹Civilian harbor pilot, CAPT Glenn Havens, also died aboard the rescue tug.

The next day they took us to Treasure Island to get some uniforms. We had lost everything but what we were wearing. I have the purse I had with me right here and it's stiff and still has the salt on it.

What's peculiar about all this is that no one ever talked to me about the sinking. The first time anybody really mentioned the event was at my separation interview. And that was about 1970.

For a long time the memories of that day kept bugging me. Why couldn't we have done more to keep Wilma with us? Some of the girls were talking to her. Some of them were praying with her. I don't really know what more we could have done to save her.

There's also another memory. When I was sinking through my life jacket and Rosemary reached over and pulled the tie down farther, I had an out of body experience. When I looked downward I could see the side of the ship with a few ant-sized bodies moving and many ant-sized bodies in the water moving away from the ship. When I was looking upward I heard harp-like music and saw a translucent stairway going up to the heavens. I didn't see anybody up there. I had ascended almost to the top of the stairs and a voice asked me if I was all right. And that brought me back, back to being in the water with Rosemary. I've often wondered what I would have found at the top of those stairs.

On 11 January 1951 a U.S. Coast Guard board of inquiry released its findings. Because of dense fog, the Benevolence was using her radar. However, the Mary Luckenbach's radar was malfunctioning and had been shut down. Even though both vessels were sounding regulation fog signals, they were proceeding at excessive speeds. At the moment of impact the hospital ship was making 15 knots, the freighter, about 12 knots. That from the time of collision until the vessel sank, 25 minutes had elapsed. The first list to port was followed by a further listing and settling by the head, bringing the main deck to sea level within 5 minutes. The Benevolence then remained somewhat stationary at about a 45 degree list and slowly capsized on her port side.

Coast Guard inspectors were unable to determine the damage below the water line, but they reported in detail the fatal damage they could see: "A hole extending upwards, five to ten feet high, from three to five feet above the water line and in length from frame 50 aft to about frame 72 or 77, a distance of about 50 feet, with one or two strakes of shell plating ripped

*out. This resulted almost immediately in flooding compartments between frames 13 and 32, 32 and 56 and 56, 56 and 82, and possibly aft of frame 82."*²

Although there was enough blame to go around, the Coast Guard report cited the Navy for failure to train the crew or to conduct any fire, collision, and abandon ship drills before proceeding to the open sea. Because the commanding officer misjudged the seriousness of the collision, he failed to order "abandon ship" immediately which resulted in delayed efforts to launch the lifeboats. As a result, the serious list precluded the launching of any of the hospital ship's 12 lifeboats; only the after starboard motor whaleboat was ever released.

The Coast Guard also found that an SOS sent immediately after the collision was futile as the antenna had been previously disconnected.

Of nine Navy personnel assigned to security patrol, eight were either eating or on the chow line at the time of the collision. Because of the absence of these men from their stations, they were unable to execute the commanding officer's order to close the watertight doors.

*The following morning, the white-hulled hospital ship rested on her side in 70 feet of water, her red crosses plainly visible. The San Francisco News described the melancholy scene. "Now . . . only the tangled lifeboats were above the water's surface—these and the crosses, which glared redly through the greenish water in the trough of each swell."*³

That same day, 26 August 1950, Chief of Naval Operations ADM Forrest Sherman ordered USS Haven (AH-12) to be taken out of mothballs to replace Benevolence. The last action that hospital ship had seen after her debut in World War II was participation in "Operation Cross Roads," the nuclear tests at Bikini atoll.

²Report of the U.S. Coast Guard Board of Inquiry into Sinking of USS *Benevolence*, 11 January 1951. *Benevolence* File, BUMED Archives, Washington, DC.

³Because the *Benevolence* had suffered such extensive damage and rested on her side, raising her was not a viable option. She was blown up as a hazard to navigation.

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The San Francisco News, 26 August 1950. □

The Need for Operational Nursing

CDR David Norman, NC, USN
LCDR Robert Arbeene, NC, USN

The need for operational nursing support for naval missions worldwide has been apparent for quite some time. Traditionally it has taken the form of involvement with fleet hospitals, fleet surgical teams, and hospital ship platforms as well as in other less known areas such as planning.

Does Navy Nurse Anesthesia have an operational responsibility? Before that can be answered, the term "operational" must be defined. The Random House Dictionary defines operational as: "able to function, to be used, pertaining to, or involved with military operations." Since Navy nurse anesthetists have a long history of supporting Navy medicine's service to the fleet, the answer is an unequivocal, yes.

In light of the 11 September murderous attack upon two major U.S. cities, the need for a rapid medical response capability of highly trained professionals cannot be understated. Operational platforms staffed with nurses, nurse anesthetists, physicians, and hospital corpsmen were deployed within hours of this terrorist attack. The impor-

tance for this requirement and ability cannot be underscored.

Operational responsibilities supporting both wartime and peacetime readiness are strongly linked. This ability to be prepared for action immediately comes from direction and planning. Guidance is promulgated from the Department of Defense Medical Readiness, Bureau of Medicine and Surgery (BUMED), and Nurse Corps Strategic Plans.

The DOD Medical Readiness Strategic Plan 1995-2000 Mission statement is all encompassing: "to provide and maintain readiness to provide medical services and support to the armed forces during military operations." This is to include preparation and training for all potential military operations ranging from war to military operations other than war (MOOTW). However, the primary goal is readiness for war.

The motto of the Navy Medical Department is, "Steaming to assist." BUMED's mission is "to ensure the health of our Sailors and Marines so that they are physically and mentally ready to carry out their worldwide mission."

The first strategic goal is "readiness." This became apparent on 11 September when the calls went out, orders were generated, and ships got underway within hours, fully staffed with their medical capability. This serves as a reminder why planning and training cannot be overemphasized!

The Nurse Corps Strategic Plan identifies Vision, Mission, Guiding Principles, and Goals for preparation of operational deployments. Because the number one goal is to support and contribute to operational readiness for wartime, as well as peacetime operations, planning and training become critically important.

Support of the national security strategy by the sea services has produced and resulted in a forward-deployed naval force prepared to meet the demands of developing crises. Today the Navy Nurse Corps is fully integrated into these forward-deployed assets. In order to continue to contribute and support these all-important missions and their medical requirements, processes must be assured that see to the training of junior Nurse Corps officers. This includes stressing the importance of obtaining and maintaining C-1 status.

Credibility throughout the operational arena is based on education and experience. "With today's expectations of short, intense, high technology wars there is no time for training after the crisis begins." (The Operational Leadership of Admiral Togo). Operational education for the Navy Nurse Corps, including nurse anesthetists, has been limited in the past. Historically, the training has been obtained through "trial by fire" or OJT (on the job training). Although this has worked, it clearly is not the optimal training method.

The question must be asked, "Are we nurses in the Navy, or Navy nurses?" In truth we are professional naval officers, commissioned by the President of the United

States. Our job and corps happens to fall within the Navy Nurse Corps. In order to gain credibility necessary to "sit at the table" and be involved with planning, evaluating, and participating, we must be trained and knowledgeable, not only within our profession, but as naval officers.

The preparation of nurse anesthetists to support operational anesthesia requirements in support of the fleet has long driven a major goal of the Navy Nurse Corps anesthesia program. This goal is to train nurse anesthetists for the independence demanded of forward-deployed anesthesia providers at sea in virtually any imaginable scenario.

The achievement of this goal has become a reality with the recent decision to add an operational anesthesia rotation to the specialty rotations available for student nurse anesthetists to experience during their senior year. The goal is graduate nurse anesthesia providers capable of rapid deployment to the fleet on Day 1.

We close with a very astute commentary from Ms. M. Adelaide Nutting, RN, the first university nursing professor. "We need to realize and to affirm anew that nursing is one of the most difficult of arts. Compassion may provide the motive but, remember, knowledge is our only working power. Perhaps, too, we need to remember that growth in our work must be provided by ideas, and that any conditions which suppress thought, must retard growth. Surely we will not be satisfied in perpetuating methods and traditions. Surely we shall wish to be more and more occupied with creating them." □

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NAVY MEDICINE THROUGH THE YEARS

January 8, 1965

Four Navy Nurse Corps Officers receive Purple Heart medal after a bomb explodes at their quarters in Saigon.

January 10, 1966

Naval Hospital at Da Nang, South Vietnam established.

February 23, 1945

Marines and Navy Corpsman (John Bradley) raise flag on Mt. Suribachi, Iwo Jima.

February 22, 1971

First Lieutenant Francis M. Brosnan, USMC, becomes the last Vietnam casualty at Yokosuka Naval Hospital.

Strategic Biodefense

A Call to Reinvent the Hospital Ship

Craig Hooper

Over the past few years, *Navy Medicine* has been host to a refreshingly wide-ranging and frank debate about future hospital ship development.^(1,2) Unfortunately, an important issue, the potential role of hospital ships in biological defense, was overlooked. Do hospital ships have a place on the biological battlefield?

Serious biodefense challenges loom on the horizon, by changing the traditional role of Navy medicine and promptly reinvigorating the somewhat tired "hospital ship" concept, the Navy has an opportunity to accelerate the development of viable large scale biowarfare defenses.

Today, America's primary floating medical assets, the *Mercy* class hospital ships (T-AH 19 and T-AH 20), are well-equipped trauma facilities that make poor disease-fighting platforms. A few other highly capable, multi-mission ships have the ability to confront basic, first-generation bioweapons, but consignment of these ships to biodefense duty will only serve to degrade Marine amphibious units. The time has come to consider developing a class of small, simple ships dedicated to biodefense. A set of public health platforms, focused on fighting disease, yet able, during a conventional crisis, to supplement America's floating trauma-based medical care infrastructure, can fill an emerging defensive niche.

Though present-day illicit biological agents are, for the most part, an array of balky, relatively ineffective, "prestige" terror weapons, new technologies and the proliferation of technical expertise make development of increas-

ingly lethal second-generation bioweapon delivery systems a viable option for several countries and non-state entities. Both infectious and non-infectious bioweapons have proliferated, and some infectious microbes, weaponized through illegal, clandestine research, have gained strategic utility as asymmetric, destabilizing tools.⁽³⁾ The Navy has both an opportunity and obligation to serve on the biodefense front line, protecting America from germs manipulated to serve as strategic weapons.

The Navy's two hospital ships, USNS *Mercy* (T-AH 19) and *Comfort* (T-AH 20), if challenged by an infectious disease crisis, can offer relatively little to stricken communities. Design shortcomings and biodefense-related vulnerabilities, evident since the Gulf War, plague the *Mercy* class, limiting the utility of these enormous floating hospitals. In 1998, Pietro Marghella summarized several problems, and his searing *U.S. Naval Institute Proceedings* hospital ship review, entitled, "Replacing the Great White Elephants with LSTs" prompted a variety of improvements.⁽⁴⁾ Small isolation units and other biodefense-related modifications have been added to the hospital ships, but, over the past 4 years, few new biodefense tools or tactics have emerged.⁽⁵⁾ The *Mercy* class remains an imperfect medical asset on the biological battlefield. Accidental or unknowing admission of infectious or infected casualties to bunks outside the tiny isolation wards poses a particular risk to other patients and to the large crew required to staff *Mercy* class hospital ships.⁽⁶⁾ The Navy needs better tools to confront infectious biological agents.

Biodefense requires flexibility, and massive, highly capable trauma ships like the Mercy class, are just too big and complex for biodefense. Widely dispersed, active duty disease fighting assets, coupled with the will to engage emergent disease problems, makes a perfect foundation for large-scale biodefenses. As diseases become increasingly effective strategic tools, Navy medicine must peer beyond limited tactical issues like battlefield trauma care, local force protection, and medical infrastructure management to consider a larger and rather ambitious defensive role. The Navy can help protect the continental United States through prompt, worldwide disease detection and control. This concept, strategic biological defense, needs a champion in Navy medicine and support from the larger national security community. Departure from the traditional, behind-the-scenes support role of Navy medicine may prove difficult, but a struggle for a flexible set of forward-deployed biomedical defense elements, coupled with a vigorous effort to change the strategic role of Navy medicine will, over the long term, make America a stronger and safer nation.

Smaller, less complex, "street fighting" hospital ships, if used aggressively, can confront asymmetric biowarfare by supporting two simple disease control tactics: disease detection and prompt disease containment. For the Navy, these defensive approaches are problematic, since disease detection and disease control responsibilities are dominated by non-military public health and policy organizations. Both civilian and military actors alike recognize that community-wide disease control failures have major strategic consequences, yet traditionalists on either side are discomfited at the prospect of enhancing civil/military collaboration. The attacks of 11 September demonstrated that terrorists and other entities interested in developing infectious biological weaponry must be expected to exploit security gaps exposed by such bureaucratic turf battles. Unless civilian and military groups agree to overcome their animosities, the all-to-hesitant and, at this point, relatively inadequate efforts at implementing joint civil/military disease control operations will only encourage biological adventurers. A new type of hospital ship, built to serve a biodefense role, can, at a minimum, act as an incubator to test what will certainly be a contentious evolution toward enhanced civil-military partnerships.

By departing from the established, trauma-based "hospital ship" concept and embracing a public health-oriented, disease control paradigm, the Navy will be better prepared to confront a future rife with asymmetric conflict. A ship built for the biological battlefield requires only a

few of the expensive features necessary for survival on an "overt" front line; biological agents are primarily tools of another, more subtle and crafty way of war fighting. Dedicating a large, complex ship, like a *San Antonio* Class (LPD-17) amphibian, or committing portions of a Marine Expeditionary Unit (MEU) to biodefense duties during peacetime is a good idea, but those ships and personnel are tasked to serve and survive relatively conventional, overt conflicts.⁽⁷⁾ During disease crises, these important resources will likely be needed elsewhere.

A set of small, economical ships dedicated to biodefense makes sense. First, a specialized biodefense ship gains a measure of tactical flexibility. After the USS *Cole* disaster, few political or military leaders will risk exposing transport and supplies for a large Marine contingent to an uncontrolled, complex harbor environment. At the moment, even vague indications of terrorist activity suffice to rush large, strategically important ships to the open sea. An inexpensive, less sophisticated, and smaller disease control ship is a much lower profile terrorist target, and even a successful terrorist attack is unlikely to have immediate national security ramifications. Second, a handful of very tightly focused, specialized personnel, modeled after Centers for Disease Control Epidemic Intelligence Service teams, can move faster, offer more substantial assistance, and be less vulnerable during disease emergencies than a relatively unspecialized group of combat-ready Marines. MEUs might be useful to handle problems ignited by grave, out-of-control disease outbreaks that are fraught with logistical considerations, but as a tripwire mechanism to quickly bolster local disease fighting "first-responders," Marine combat units are a poor choice.

Other biodefense advocates envision using pre-deployed land-based or airborne assets as a means to quickly examine and evaluate disease outbreaks. Though those options, at first glance, appear economical and quite capable, a ship-based laboratory and logistical facility provides added flexibility during what will be, in most cases, a delicate diplomatic situation and a deteriorating operating environment. Permanent disease monitoring centers are both expensive and vulnerable to social unrest or political disturbances.⁽⁸⁾ Admittedly, Navy Medical Research Units and other fixed disease control assets are incredibly valuable facilities, but potential interruption of regional disease monitoring, epidemiological consulting efforts, and the limiting of laboratory use is unacceptable—especially during crises that offer perfect cover or justification for the dissemination of infectious disease weapons. Airborne disease control assets are both faster to deploy and nec-

essary for inland regions, but their insertion requires extensive interaction with a host government—a government that may be unwilling or unable to respond quickly during a biotech crisis.

A ship is an interesting compromise. By offering safe, relatively robust laboratory facilities, supportive medical care, and basic tactical intelligence, forward deployed biodefense ships permit in-depth and vigorous action by disease-fighting “first-responders,” be they local medical providers, Centers for Disease Control investigators, or some non-governmental disease control organizations. Disease fighters are usually at the end of a very long, tenuous, and fragmented biomedical support chain. They will, as bioweapons enter more and more arsenals, need the extra assistance.

What type of ship can serve in a biodefense capacity? A scaled-down version of Australia’s inexpensive Multi Role Auxiliary (MRA) concept ship might be a robust yet relatively frugal starting point for design discussions.⁽⁹⁾ More ambitious, longer-term solutions might evolve from the R/V *Triton*, a trimaran currently undergoing seaworthiness trials.⁽¹⁰⁾ Any basic, small-crew, high-endurance platform, able to operate for long periods in unimproved harbors, will make a good foundation for a new class of disease-control ships. Coupled with a well-appointed, possibly modular research lab/infectious disease hospital and some modest amphibian, helicopter, and UAV capabilities, a rapidly arriving disease control support craft can direct a pulse of aid and information to struggling local doctors, epidemiologists, or other disease control teams. A medical ship can securely coordinate needed logistics and communications for further deployment of disease fighting personnel, or, perhaps, elements of a larger security force. Even limited assistance, delivered in a timely fashion to key local medical leaders or crucial facilities can go a long way toward hardening local public health infrastructure and halting small, nearby disease outbreaks.

Would a set of disease control ships fit into America’s fledgling biodefense efforts? Who knows? Homeland defense, a still-evolving defensive concept, focuses upon protecting the U.S. mainland from asymmetric threats. Though a valuable initiative, homeland defense is inwardly focused, and, given the panic over Anthrax-laced mail and the prospect of more terrorist activity, hurried efforts to implement large hi-scale domestic security programs will drain resources and even hinder efforts to create effective, forward deployed, strategic biodefenses. America needs an overseas biodefense element; diseases, thanks to global trade links, better transport, and higher rates of

travel, can easily “escape” from far-off battlefields, illicit bioweapon laboratories, or even tiny, isolated villages and spread into naive, vulnerable population centers. The Navy, by developing and supporting forward deployed, active duty disease control assets, can supplement control efforts abroad before a disease grows into an imminent threat to the continental United States. Stopping a fulminating, raging epidemic at the border is a much more risky, difficult, and costly endeavor than the alternative, containing isolated disease outbreaks overseas. Such efforts are also useful in advancing long-term disease control strategies that may, in the future, prove valuable to America.

In a world where natural disease events and acts of war are increasingly indistinguishable, the ability to rapidly project substantial medical and scientific support into the littorals will prove a useful resource. The stakes are high. Experts from a disease control ship can help soothe panicked command and control elements during a disease crisis; in certain nuclear-armed countries like Pakistan or India, the attendant confusion and social disruption might easily spark a miscalculation and, potentially, an unwarranted nuclear response. As fear of biowarfare grows, biodefense ships might serve to assure potentially targeted countries and even deter biotech attackers. Asymmetric efforts to disrupt America’s far-flung logistical, intelligence, and alliance base can occur at any moment, diverting attention before an overt crisis or entangling operations after hostilities commence. The realistic economic, political, and military consequences of infectious bioweaponry used overseas pose an often un-discussed, un-publicized, and under-appreciated strategic threat that America, reeling from domestic bio-assault, can ill afford to ignore.

“Consequence management” is the obvious mission for sea-borne assets detailed to strategic biological defense. Most littoral regions of interest to the Navy already over-extend their medical resources and are unlikely to successfully undertake large-scale, rapid, and coordinated disease identification and control efforts. The heavily urbanized littorals are a particular problem; these regions are likely targets for epidemics, natural and intentional alike, and the possibility for rapid international dissemination is quite high. The occasional crisis response mission, however, is only a single, albeit high profile facet of strategic biological defense. The real defensive contribution, quite simply, stems from routine and unexciting tasks. □

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Book Review

Nightmare on Iwo by Patrick F. Caruso. Naval Institute Press. Annapolis, MD. 184 pages, 2001.

As America looks upon the many faces of heroism we are not short of ordinary men and women who by virtue of being heralded in extraordinary times give their full measure to save lives and advance the cause of liberty. Patrick F. Caruso, a second lieutenant in the Marines, served in the Pacific campaigns of World War II. His first books were originally pieces of scrap paper with notes jotted down 50 years ago as he was recovering from wounds sustained in battle at a hospital in Guam. Thank God, his accounts have been published for he gives a ground view of the Battle of Iwo Jima, as he narrates accounts of those under his charge who lived and died.

Despite the carnage, it is difficult not to see the relationship and bond he had with members of K Company, Third Battalion, 9th Marines. From the moment the assault began, cries of "Corpsman" rang out. The Japanese noticed this and too began calling out for corpsmen as a ruse, killing those coming to their aid. Caruso writes how Japanese snipers disregarded Geneva Conventions and specifically targeted corpsmen as they tended the wounded or wore the internationally recognized Red Cross. Each Marine whether lying wounded in the ash or in the dense foliage, recounted how the "doc" was an angel of mercy. The author recollects how each company was assigned two corpsmen split between two platoons. Making their way toward Iwo Jima, K Company stopped in Guam.

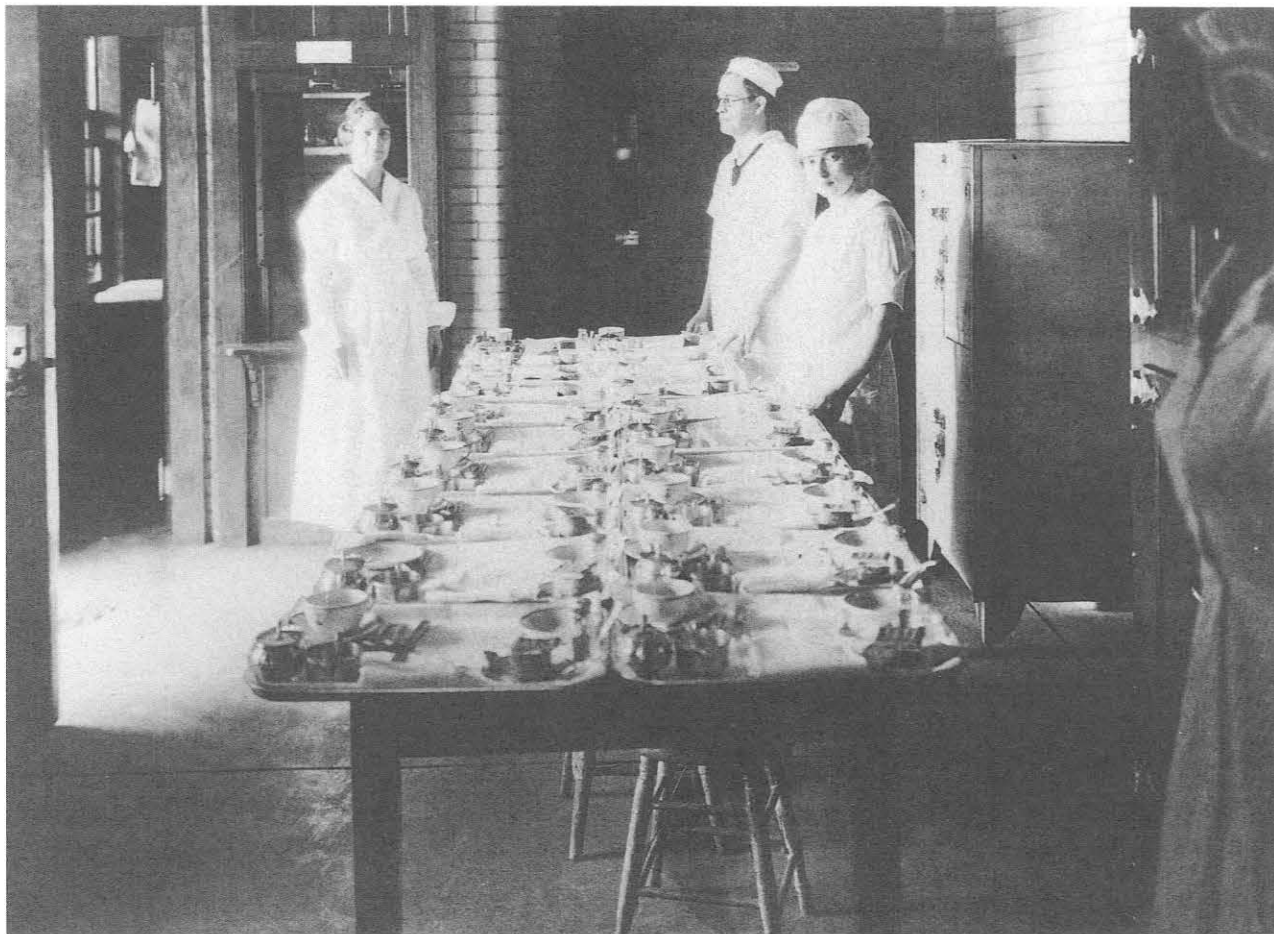
As the men waited on the docks, they encountered two Navy corpsmen, one big in stature, the other small. To Caruso's disappointment, he was assigned the smaller of the two.

The corpsmen's name was HM Troy Young who would repeatedly distinguish himself. Calm under fire, he had a "battleside manner," that eased the stress of wounded Marines. The larger corpsman succumbed to battle stress the second day of the Iwo Jima assault, but later rejoined his unit. Among the Marines Young saved was PFC Vernon Huckaby of Louisiana who survived campaigns in Bougainville and Guam. LT Raymond Ickes, shot through the lungs and treated and evacuated by Young, was the son of Interior Secretary Harold Ickes. He lived to serve as an attorney during the Nuremberg Trials.

Young's saving skills knew no distinction in class or position in life. All his patients were grateful for his determination and ability to dodge the enemy and save his shipmates. The book's cover appropriately features four Marines carrying a wounded comrade on a stretcher. This is a powerful and moving memoir, highly recommended for those interested in the Navy and Marine Corps heritage as well as that of Navy medicine. □

—LT Aboul-Enein is studying at the Joint Military Intelligence College and serves as an Arabic linguist for area commands in the Washington, DC area.

Navy Medicine 1919



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Trays set up in the main diet kitchen, Naval Hospital, Chelsea, MA.

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